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VOL. XXXIV JANUARY, 1924 No. 1

THE LARYNGOSCOPE

AN INTERNATIONAL MONTHLY JOURNAL
DEVOTED TO DISEASES OF THE

EAR - NOSE - THROAT

FOUNDED IN 1896 BY
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Subscription, $6.00 per Annum, in Advance.

Foreign Subscription, 35 Shillings per Annum, Post Free.
Single Copies, 75 cents.

PUBLISHED BY THE LARYNGOSCOPE CO.
3858 Westminster Place, St. Louis, Mo., U. S. A.
FOREIGN OFFICE, BAILLIERE, TINDALL & COX,
8 HENRIETTA ST., STRAND, LONDON, ENG.

(Entered at the Postoffice at St. Louis, Mo., as Second-Class Matter, in July, 1896.)

Vol. 2 OCTOBER, 1928 No. 4.

ORALISM AND AURALISM

A QUARTERLY JOURNAL DEVOTED EXCLUSIVELY TO PROBLEMS OF THE

DEAF AND DEFECTIVE SPEECH

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Subscription, $2.00 per Annum.

Single Copies, 50 cents.

PUBLISHED BY

THE LARYNGOSCOPE CO., ST. LOUIS.

THE

LARYNGOSCOPE.

Vol. XXXIV ST. LOUIS, JANUARY, 1924.

ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding that they are contributed exclusively to THE LARYNGOSCOPE.)

THE ORGAN OF SMELL.

(Translated from Kuhn's Greek and Latin Texts.)

DR. JONATHAN WRIGHT, Pleasantville, N. Y.

Fully alive as I am to the audacity of one who is not much of a Greek scholar and not a paleographer at all in offering an English translation of even this small treatise of Galen, making use of a faulty edition, such as it has been admitted and is only too evident Kühn's edition is, I find my most ready excuse in the fact that there is no English translation of it at all, nor of any of the other books, except those Brock has put into English. Faulty as is the Latin translation of Kühn and possibly his transcription of the Greek text, the former, at least in the case of this short essay, is largely, if not entirely, a transcription of the magnificent Latin edition of Galen by Venetian authors in 1609, which I have had occasion to consult. Notwithstanding my illustrious predecessors I have been occasionally bold enough, in what follows, to depart a little from the Latin rendering of the Greek text, but only in a few minor matters that have no bearing on the general sense of the Greek text as it appears in the Kühn edition. Galen was so often befogged by the demands of humoral doctrines and the anatomy of his day, some of both his own creation, and they fell so far short of the facts that the confusion of mind into which these betrayed him has evidently resulted in a confusion of diction at times which is only too apparent. There is no book of Galen that more glaringly exhibits these defects than the present one and this I claim makes it an interesting document to the student of the history of thought. No really noteworthy analytical history of medical thought is possible in our day until Galen has been successfully turned into English, in accordance with the demands of modern scholarship, or into some other modern tongue. Let us hope, at least, it will be English and by more competent translators than the present one.

(Galeni Opera Omnia, Kühn Ed. II, Vol. 857-886.)

I

Smell the Greeks name not only the diagnosis of odors but the faculty of which this is the process, just as the gustatory sense is

Accepted for publication, Sept. 25, 1923.

not only the distinguishing of tastes but the power to do so, and so, as exhibiting both, the organ of smell may be said to be one through which the faculty manifests the power of discrimination peculiar to it, analogous to the eye and the tongue. At the first attempt at diagnosis this seems to be the nose. By inhaling through the mouth, however, those holding the former closed, in any manner whatsoever, will get no perception of odor, but when we breathe in through open nostrils we perceive it well. It is well worth examination whether the membrane or the tunic (for they give the two names to it), covering each of the nasal passages within, perceives the odors, for neither the bone nor anything in it is the organ of smell, worthy of examination. If you fill the nostrils with fragrant myrrh or anything else having a strong scent, it is not perceived until inspiration takes place and the nose seems therefore to some to be the path of odors, but the organ which perceives odors is situated higher up. On this account it is necessary that the bodies connected with the passages of the nose should be known to those who are being taught anatomy. These things not being known to all it is better it should be described in full how it is arranged.

II

The nose has a septum in the middle and hence two important channels, these being apparent, one in each nostril, but one must be aware they are divided into two higher up. One of these divisions goes backward to the mouth and the other straight, as it is directed from the beginning, mounting upwards to the brain itself. The brain, beneath it, has two outgrowths elongated and hollow, having their beginnings from the anterior ventricles coming down to that part of the cranium where the nose begins. Here is the seat of the sieve like bones, the use of which the name sufficiently indicates and the dura mater overspreading these bones is pierced with minute holes. Through this is filtered the thicker part of the superfluities of the brain. It was the custom, first beginning with Aristotle, to call these superfluities. The more vapor like ascend through the raphae (of the calvarium) and empty it. The thick discharges, such as those in acute or chronic catarrh, are carried down, first passing through the dura mater, after that through the ethmoids and then they are evacuated into the channels of the nose. In its way through the nose there is a part of that coming down which runs into the mouth, through passages spoken of, from the nose into it, the thicker discharges, especially those which are glutinous, falling sometimies at one end into the

channels going to the mouth, at another into those emptying into the nose, expelled by forcible blowing or by hawking up through the mouth. A bloodless (*sic*) tunic, thicker than a membrane covers the straight channels carried up to the ethmoids and in addition to the other sloping ones which end in the mouth, as I have said. This tunic is continuous also with that covering the periphery of the whole mouth within and surrounding the tongue and with those coating the pharynx, the larynx, the trachea and the oesophagus. In this tunic, existing as one continuous structure it appears the same in all the mentioned parts, yet has not an equal thickness. In all of them there are distributed certain nerves from the brain, small except those going to the tongue. The latter must have a suitable thickness for the reason that much sensitiveness is necessary to the part associated with the sense of taste. Nature has given thicker nerves still going to the eyes than those going into the tongue, after these those to the ears and those going to the orifice of the stomach, since it is necessary also that this last should be very sensitive as in treatises heretofore I have shown. Just as the eye is the optic organ, the ear the acoustic organ, the tongue the gustatory organ, so the stomach is the organ for the desire for food and drink, and this especially at its cardiac orifice. Consisting of rough structure for discrimination, nature gave it very sensitive attributes of touch and these not segregated in one particular spot, but spread out over the whole organ. Also because of this it supplied it with plenty of smaller nerves, the harder ones being derived for the most part from the spinal cord. Into the aforementioned parts, needing an extra sensitiveness, it sent larger and and softer nerves, sprouting from the brain. It made the organ of sight crystal clear, as that alone is sensitive to light and brilliance, full of air the organ of hearing to make also this responsive to the slightest sound by means of the air. Thus also the organ which differentiates the juices, the tongue, nature shaped from the moister elements of the body. By virtue of air, moisture and fire, mingled, the sense of smell exists, not so light as air, nor so dense as water. So far as it has its origin in each of these elements it is the essence of things that it can smell. This is especially to be thought of as to roses and things as simple, which on account of their volatile nature become at the time of their emission smaller and drier, as manifestly the moister parts have vanished from the constitution of these.

III

We will now investigate the instrument of smell and although beginning with the structure connected with the nostrils, we will

examine the forms of energy associated with these. So, since over the channels below in the nose there is spread this tunic, which I have said in constitution and continuity joins with that below in the mouth and on the tongue and the pharynx, except that it is more thinly formed, we must either say this is the organ of sense for odors or it is the bone of the nose, for there is no third part there; but as a matter of fact there is nothing of odor perception nor function associated with the bone of the nose. As for the tunic over it, it exists there very much resembling that on the palate and in the pharynx and, reasoning from this, not liable to possess any greater exactitude of sensitiveness. Certainly from its dimensions alone it is incapable of containing any great number of nerves, like the tongue. It appears that the latter not having more, yet sufficient for the tactile sense, has just that much and no greater share, but this tunic in constitution is a structure not in accord with sense organs like the rest, the organ of sight crystal clear, that of hearing light as air, that of taste moist and like a sponge, that of touch hard and earthy, each organ being designed by nature to resemble the thing felt. So it was desirable also that the sense organ of smell should be like vapor, not hard and earthy, like that in the nostrils, which is not supplied with noteworthy nerves, all of which it should have, more than the tongue, and thus equipped it would hold third rank among sensitive organs and serve for the diagnosis of the more volatile substances. As to size the nerve of vision comes first, inasmuch as it is much larger than the one going down to the orifice of the stomach, but yet it is not distributed to the whole eye, only going to the crystal body. This is the chief part of the organ of vision. The acoustic canal having a very short limit within, which touches the nerve, thus receives a thick nerve in the comparison of size. Yet the tongue is supplied from the brain with nerves not at all small. Therefore the organ of smell should have no small one, such as those are beneath the tunic of the nose, and this too should be of a vaporous kind, for that is the nature of odors. Thus we are led away from the territories within the nostrils, in attempting to get from the structure an indication of what is sought. From the characteristics of the forces examined no differentiation of odors can take place without inhalation, although sometimes the channels of the nose may be full of vapor having great power. If any one burns in a very small room asphalt, cassia, myrrh, frankincense, storax, filling it with the strongest odor and going in should try taking deep breaths at long intervals, he will know the truth of what has been said, smelling the odor only at the time of inspiration and all the rest of the time

having no appreciation of it at all, though the channels of the nose are full of it. So too if you drop into the nostrils anything very heavy with odor, in that time only during which you breathe in will you get any odor at all. It seems therefore there is some other part capable of detecting odors, hidden somewhere deeper in the body, not close at hand, nor outside, as the tunic of the nose, but we learned in the books on respiration, when the thorax is dilated by certain muscles the lung follows after it and hence of necessity the external air in connection with it through the trachea, the pharynx, the mouth and the nose. If therefore the tunic throughout the nose is not the organ of smell, in turn let us examine that over the vault of the palate and then that of pharynx and trachea. That over the palatal vault can not be the organ of smell for if those having blocked up the nostrils or compressed the alae with their fingers breathe in through the mouth no perception of smell arises. On account of this one must suppose neither the pharynx nor the trachea have any control over it.

IV

It remains to examine that covering the other end of the nasal channels and which is carried up through the ethmoid bones to the brain. Here also there is a similarity of plan, a tunic lining the passage, similar to that below, having a structure suitable to it and a tenuity of nerves, but from circumstances different. During inspiration it is permissible to believe that the brain, energizing itself and dilating the thorax through the proper nerves derived from it, draws something to itself and to its own ventricles. This is not impossible; on the contrary it can furnish its own power, nearby in action, to itself and from itself, the brain being compressed whenever it contracts into itself and being distended whenever it wholly distends its parts. Whenever it collects the external air, it flows into it continuously, just as it flows back when it relaxes. Inquiring into this matter once it came about by chance, in a man affected with coryza and a chronic discharge, that the sense of smell returned with the aid of nigella sativa. This was ground up into a fine powder carefully and then, mixed again carefully with old olive oil, it was strained through a sieve. Then the patient, having filled his mouth with water and thrown his head back and much of the medicine being made to run into his nostrils, inhaled strongly. Upon the third day following the young man having made use of this procedure was much benefitted. On the fourth day inhaling more zealously than usual, he felt a severe sharp pain deep within his head, but in a short time this markedly diminished and it was wholly gone on the morrow. It seemed to me therefore

some of the nigella had been carried into the cavities of the brain, which sit close to the choroid plexuses and likewise into the brain itself. The necessity for the organ of smell to be in any way vapor like appears to agree with this. On account of this being thoroughly believed I also introduced it into the noses of many slaves, one after the other, commanding them to inhale strongly. Some not at all, some indistinctly and some felt a sharp pain in the middle of the head. Coming to a conclusion from these things and from others mentioned before, I believe the sense of smell arises in the ventricles of the brain. Evidences not without their weight in addition present themselves to me in abundance. First, that of sneezing aiding very much heaviness of the head, whenever the brain is filled with thick vapors; second, the brain is filled and warmed at the checking of respiration, as I will explain a little later. It is therefore likely it needs expiration to free it of irritating objects and inspiration because of its cooling effect. Still a third, the head being overheated in the sun and otherwise affected by heat, we perceive the odors of roses and of other things such as have a gently cooling effect, plainly counteracting the heat. Not in this or in any other manner is it possible for the sensation of smell to originate in the tunic of the nose, and this, asserted by Aristotle, should find only very short credence. If examined it is found to be false.

V

In order that the question of the whole theory may become clearer let us begin at the end of the chapter above. Inquiring why the sensation of odors arises in those inhaling, at that and at no other time, if indeed its origin is in the channels of the nose, this one thing only seems evident to me, that not at the external surface of the tunic of the nose, but very deep in the organ the sense of smell is located, certain pores extending up to its site, not open continually, but having a thin membrane as covering, and these being opened at the time of respiration by the impetus of the pneuma, thus the object perceived comes to the differentiating part. Aristotle also has something like this in his second book concerning the soul and in that concerning sensation and perceptible objects; and it is written in another way, *Concerning the senses and the sense organs,* since thus it is the custom of Aristotle to call the organs of perception. As to the second book concerning the soul exactly the same is there written: "Thus in some animals the smelling apparatus is uncovered, like the eye. In some who breathe air there is a cover, which, when the breath is drawn, is lifted, the veins and the channels being widened." In the book concerning the senses and the sense organs this is what he says: "But in those who in-

hale, the pneuma removes what lies there like a lid and therefore that which is not inhaled is not perceived; it is absent in those not inhaling, just as happens with the lids of the eyes of animals, which not being lifted it is impossible for them to see. This is the rule in those who do not have hard eyes, since in the latter indeed there is no need of any covering, but they see from the ability to look straight out through them." These are the sayings of Aristotle, he having not at all attempted to investigate the part in which we first have the perception of odors. But that said by him about the uncovered channels although it is not impossible, just like certain other things said by some, nevertheless it is not possible to co-ordinate it with the channels of the nose. As to our eyelids it is accomplished at our choice and hence it is possible, whenever we wish, both to close and to open them, but for the sense of smell this is not the way of it, for this action of the opening of the channels is an accompaniment of the inhalations, and is not our work. Yet Aristotle, the father of logic, was right to have built his doctrine strongly, but he did not set it forth plainly, being inclined to speak to us concerning his opinion in the rôle of a prophet, saying nothing clearly, so that he has not made evident the arrangement which he asserts of the channels, whether it is in the tunic of the nostrils or in some other place he wishes to locate pores of smell, but that this place is not in the nostrils is evident. For thus it must be that pressure coming from without would open them, if the pneuma enters without there being any inhalation. That it does not do so can be plainly seen; first a force of air may be devised in the small room filled with the strong odor, second also by turning the nostrils to the wind in such a place, third placing in the nostrils some one of the instruments able to force air in. Such are hollow reeds and bladders perforated, having horns out of them. But in sooth, all these things forcing in the air no perception of smell arises. This is to say there is not in the tunic of the passages such power as is in the cavities of the heart, which, being dilated, it happens the mouths of all the vessels carrying material in are opened. Then it is possible to suppose this power originates at our will in the channels, or apart from the will, such as arises in the heart. If, according to our desire, it would be necessary for these to dilate without inhalation in order to detect an odor. If done involuntarily, it is very evident this would occur also without inhalation. Nevertheless in no way do we detect it without inhalation. It is quite apparent then that in the sensitive passages of smell neither with nor without our volition is there any efficient motive force inherent in the act of smelling. The power of the respiratory passages will be

in no way able to dilate the paths of smell. The thorax itself in the books concerning these has been shown to be dilated by muscles. The lung itself following upon it entirely and dilating with it joins in the expansion. Following upon this is the external air, the organs which carry it in being not yet of necessity dilated, neither the mouth, nor the nose, nor the pharynx. These expanding only so much more of width as they had before, it is not necessary for them to gain more. From what has been said therefore it is evident that the power of the breathing organs below is not able to open those slender pores of the tunics of the nostrils. So that it is from the mere impact of the air they are opened, which, as I have said, could also have been devised without inhalation. And if any one of those babblings many things foolishly concerning the lack of sensation, the pores being open only at the time of inhalation, should so speak I would at once remind them that at the beginning of the discussion this was agreed to and was a part of the argument, at which time I said that at the impulse of the animal or some act of nature this opening takes place. According to our will it does not take place, for then it would take place whenever we should wish to open them also without inhalation. Nevertheless it is not an act of nature like that of the heart for thus it would not originate wholly at the time of inspiration but have its own rhythm of force, sometimes when inspiration occurs, often during expiration and the interval of no respiration at all. If therefore not from these nor from the powers of the organs of respiration are the pores in the tunic of the nose opened it remains that it comes from the impact of the air upon it, which, as I have said, it is possible to bring about also without inspiration. And if any one should be in doubt for what reason nothing is carried with it up into the nose by such a force, if it becomes very violent, there being wide openings into it so that the thickest discharges of the brain are carried through it, I would say this, that nothing is carried into the larynx and lungs, due to the same powers referred to of the air in the nostrils, when they have been previously filled with the proper pneuma. Since not into these large pores anything of the outside pneuma enters, except the organs are dilated, probably it does not in those so small that they do not seem to be present to those carelessly dissecting. Of course if you place a tube in the nostril exactly fitting it no pneuma is able to go through it until the mouth of it is open, but this being open the pneuma going to the palate from without tends to come following on continuously. So do not think that any of the pneuma with the pressure in the nose just spoken of enters up into the brain. For until this broad space should become filled with it from other pneuma it is so ar-

ranged nothing else could enter there before the brain is dilated, which is in a state to be so when we are inhaling. It is dilated first in order that it may suck in and then it thus receives the outer air. Except at its diastole it is not possible for it to receive any pneuma even if it is forced violently. If so and any one should desire it, being violently forced it perhaps enters, but not much can do so. For although the air as we know may be violently compressed and likewise attenuated anywhere, these being a necessary part of its attributes, nevertheless no such cause constrains it nor does any place which it occupies conduce to it. Although when it is compressed it is not forced into a smaller place when being expanded than when it is attenuated, it makes a great change in each case, but it also is expanded and contracted a little in each instance. On this account nothing pushes into the brain, even if one uses violent force with open nostrils. The tunic covering them, in which we have presupposed sensitive channels, manifestly feels it when struck forcibly by the impact of the external air. So that it was necessary these channels should be open to the invasion of the surrounding air into the nose and, these being open, that the perception of odor should follow. If therefore this does not follow, these channels we speak of can not be there. But it is not credible nature has done something for nothing. If it has made certain paths for smell it would not have occluded them just as it has not those in the ear. For it is better there should continuously be a sense able to diagnosticate its own proper sense object, not at the time only of inspiration. Not on account of this has nature made covers for the eyes, because it may be better to keep them continually at work, but because they are soft and through this are injured by objects directly impinging on them, from which, that they may be protected, nature has shielded them by covers suitable for this protection. With negligence Aristotle has said that in animals which have a hard external tunic of the eyes nature has not made any covering, because they are insensitive and for this reason there is no protection nor roof nor cover for these animals necessary. We need them very much on account of the reasons stated and when it comes time to sleep. For in an atmosphere of bright light it is impossible for any one to go to sleep without sheltering the eyes. Thus it is with those animals which do not have eyelids, beetles, lobsters, paguri, crabs. Nature has made certain concavities like store rooms to receive the eyes entire, whenever they wish to sleep. When they want to use them they bring them out entire together with their necks, on which they are, in a place which is at the highest of the parts of these animals. There

has been a sufficient discussion of all these matters in the books on the Utilities of the Parts, where if any one will read he will know the use of the eyelids and recognize how always in nature there is provision for keeping the senses at work. If sometimes for some other more useful purpose at a suitable time it is necessary to rest them, that is no point disputed in the argument. This can not exist with other activities. Not if all the gods should wish to unite upon it could this be brought about by them. Whatever in the nature of things is impossible, is impossible for them also. Do not however wonder at this, how nature ever desirous to keep the senses active inclines them to rest during sleep; it desires sleep for this purpose and that especially. It is not however the proper time for me to discourse on the nature of sleep. It is spoken of in my other works on the several problems of physiology and pathology. Whether sleep is physiological or pathological it is not possible during it for the sense accurately to record impressions. Because therefore during sleep we are not able likewise to keep our senses active the argument is not a false one. It is better to say each sense always gathers energy by intermitting its work. Not, as when we are compelled to close the lids to be on guard against anything approaching or striking the eye from without, do we at this time only fail to see. It would be better, if we could preserve them unhurt, that we should see then too. Since this is not possible to bring about we are compelled to close the lids. Thus let the same be said by me concerning the uses of the lids, of many things a few, for it is not an opportune time to linger. We will therefore return to our discourse on the paths of smell which Aristotle says have a veil over them, contrary to nature, not explaining there is any necessity for such an arrangement, nor demonstrating its existence. For not only without necessity would such things have been as Aristotle says they are, but they would work a great disadvantage, for the most part of life impairing our sense of smell, which it has been seen does not occur with any one of the others. When we are awake all of them are continually on the alert, at least when they have an abundance of things capable of making an impression. That there are veils over the paths of smell is not evident and it is an unproved hypothesis, not evidenced by a single one of its manifestations, and this I think I have shown.

VI

Let us see in its turn how sneezing cures heaviness of the head, very deep inspirations followed quickly by expiration. I call expiration direct emission of the breath. If nothing is emptied out of the brain by these, the heaviness of the head is not relieved

through the sneezing; frequently it is on the other hand filled by the direct inrush of pneuma from without and still more affected by its impact. It appears thus in fact suggested by the loud noises. There are certain affections associated with the head, such as lethargy and coma especially, and they are most quickly relieved by sternutatories. When we gaze long at the sun a sneeze is excited in us because, I think, of the vapor descending upon us similar to the pneuma in the brain. Sternutatories completely clear out thick and glutinous discharges carried along with the expelled pneuma. It is not likely the pneuma is carried out from the brain by sneezing and nothing is ever carried in and this notwithstanding there are many perforations through the ethmoid bone and the meninges lining the parts above. Moreover that the head is at once made painful and made heavy when filled by strong odors and sometimes the patients are seized with delirium is a sign that some of the material itself is carried into the brain. For it is not thus violently and directly oppressed from being associated with only their effluence. From the nature of the case it is likely that a brain suffering from sunstroke should be relieved by the odor of roses and also at this time, not less than the help it gets from roses, cold air inspired benefits it just as very warm air seems inclined to do it harm. At any rate the whole respiration is carried on by the brain for preserving an equilibrium of heat in the heart and it is reasonable, I suppose, to provide first for that in a part most susceptible of being injured by tending towards extremes, whether of heat or cold. How now? Has not nature bestowed upon it a power born with it, fanning the flame and throbbing in inspiration, although in expiration sometimes thrusting out phlegm like discharges and the secretions of coryza? It may be evidenced to us in our recollections of the powers of plants, all parts of their bodies having a repelling power over other matter and an attractive force for what suits them. It is seen clearly in the functions of the stomach and the womb. Has not nature given powers to the stomach for attracting what is useful and, on the other hand, for rejecting what is harmful? And the brain alone, has it not these? Or do the superfluities linger in the ventricles, carried down alone by their weight, little by little discharged within the nose? One can not think so, especially since turned on our backs we lie the whole night through. For some apoplexy, or coma, or epilepsy supervening would overtake us when its cavities are full. Often in those with perforations of the brain stupor at once sets in, the attendants on the surgeons sometimes unduly pressing upon the cavities in the brain, yet thus why do I call them cavities?

INTRANASAL CARCINOMA IN ASSOCIATION WITH NASAL POLYPI.*

DR. ARTHUR J. WAGERS, Philadelphia.

Carcinoma in the nose is a condition rarely encountered. H. Lambert Lack, quoting from the statistics of Schmit, states that the appearance of both sarcoma and carcinoma does not amount to more than five in ten thousand cases of nose and throat disease. Herzfeld saw one case of malignant disease in twenty-eight thousand out patients. Finder saw five cases in forty thousand. In 9554 cases of cancer, the nose was affected in but 4. Gurlt, in 10,000 cases of malignant disease, found the nose affected in 18, in 4 by carcinoma and in 14 by sarcoma.

Because of the infreuqent occurrence of this condition, it was thought that the following report on a case seen in Dr. George B. Wood's service at the Polyclinic Hospital would prove of interest.

A white woman, aged fifty-five, came to the clinic complaining of severe epistaxis. Because of her evident weakness and the possibility of continued severe hemorrhage, the bleeding was immediately checked by packing and the patient was sent to the ward for study.

Family History: Father dead, cause of death not known. Mother living and well at the age of about one hundred years. No history of malignancy in other members of family.

Past History: Whooping cough and measles in childhood; pneumonia ten years ago, and influenza five years ago. No other serious illness. She is the mother of eleven children.

Present Trouble: On the date of admission, January 2, 1923, patient was anemic and weak, and with her almost snow-white hair presented the appearance of a woman much older than her years. She stated that she had suffered from nasal obstruction since about twenty-five years of age, but had never sought relief until three years ago, when she visited a dispensary where nasal polypi were removed. For a time she was entirely relieved, but later it became necessary to have the growths removed again. Apparently no unusual circumstances followed this second re-

*Presented at the May, 1923, meeting of the Philadelphia Laryngological Society.
Accepted for publication, July 23, 1923.

moval, but three months before the present visit to the hospital, she underwent a third operation for the removal of polyps. At least such was the condition so far as the patient knows. Following this last operation, instead of experiencing the usual relief, she had suffered from repeated and severe attacks of epistaxis. Also, during the past three months, she had complained of shooting pains which appeared to radiate in various directions from the naso-frontal region as a center.

Inspection: Externally the nose was somewhat expanded and light pressure over the bridge gave one the impression of touching a mass of putty. The skin about the inner canthus of the right eye appeared somewhat swollen and was of a light purplish color. Internally, the right side of the nose was seen to be filled with masses of tissue resembling ordinary nasal polyps. This tissue was bathed in a rather thick, semifluid material which appeared to be composed of a mixture of mucus, pus, and bits of necrotic tissue. So far as could be determined, the polypoid masses were attached to the outer wall of the right nostril. The same condition was found in the left side of the nose except that in addition to the polypoid masses on the outer wall, there was a mass of rather firm tissue attached by a broad base to the anterior portion of the septal cartilage.

It was possible to introduce the naso-pharyngoscope underneath the tumor on both sides of the nose, but as the mass came so nearly in contact with the lens of the instrument, the only point determined by its use, was the fact that the growth occupied the entire length of the nasal cavities. Very slight manipulation was sufficient to produce free bleeding, which, however, was easily controlled.

In spite of the fact that we had here, what, from the history given, appeared to have been an ordinary case of nasal polyps, we were obliged to take note of three new factors in the case which had not been present until approximately three months ago. I refer to the severe and oft-repeated epistaxis, the pain, and the presence of a distinct new growth on the nasal septum.

It is seldom that we find any one of these conditions present in the ordinary, uncomplicated case of nasal polypi. Experience has shown that such a combination does suggest milignancy. The questions to be answered in this case were: Had we to deal with nasal polypi only, was the growth malignant only, was lues a factor, and finally, did the growth represent both benign and malignant forms of tissue?

By way of further study, the following laboratory examinations were requested: Urine, blood, Wassermann test, and X-ray. At the same time it was deemed advisable to make a histological study of the tissue. For this purpose, suitable pieces were removed from different portions of the growth in the right nostril, and from the left side, a portion of the growth on the septum was taken.

Reports from the laboratories: Urine—Color, straw; Reaction, neutral; Sp. G., 1020; Albumen, faint trace; Sugar, none; Casts, none; Leucocytes and pus, 5 HPF; Red corpuscles, none; Epithelium, many squamous renal; Crystals, none. Large mucous shreds.

Blood: Erythrocytes, 3,580,000; Leucocytes, 5,900; Hemoglobin, 45 per cent; Small lymphocytes, 13 per cent; Large lymphocytes, 13 per cent; Transitionals, 1 per cent; Polymorphonuclears, 69 per cent; Eosinophiles, 4 per cent; Basophiles, 3 per cent.

Wassermann Test: "Negative in all dilutions of sera."

X-ray: "Examination shows opacity of frontal sinuses, opacity of ethmoid cells throughout, with total destruction of nasal septum and destruction of the floor of the frontal sinuses and nearly all the septa of the ethmoid cells. Even the maxillary sinuses appear to be opaque. If lues is eliminated, then this is undoubtedly malignant."

With a negative Wassermann in this case, we feel confident in eliminating lues and turn now to the pathological report on the tissue submitted.

"Both lot No. 1 (from left side septum) and lot No. 2 (from right nostril) show squamous cell carcinoma. There is also a benign polyp included in lot No. 2."

Thus we have definitely established the diagnosis of carcinoma in association with nasal polypi.

Treatment: As to treatment in this case, it was decided to be inoperable owing to the wide extent of the growth, involving as it did, the whole of both nasal cavities and extending more or less into all the accessory sinuses except the sphenoid.

The possibility of destroying the growth by radium was considered as the only method of treatment likely to produce favorable, though probably only temporary result. However, the patient refused longer to remain in the hospital, saying that she wanted to go home and take a rest before undertaking any course

of treatment. She left the hospital and has not been seen since.

This case is of interest mainly from the standpoint of diagnosis and the pathological questions involved.

From the history given, we may reasonably assume that nasal polypi had been present to some extent for approximately twenty years. We are told that tissue, supposedly polypoid, was removed three years ago. Could the tissue removed at that time have been cancerous? We do not know since there is no record of the tissue having been studied, but there seems to have been no clinical evidence pointing to malignancy at that time. The same holds true for the tissue removed at the second operation. We have no proof that the growths removed three months before admission were cancerous, but the subsequent history of bleeding and pain leads us to suspect that carcinoma had by this time developed.

The questions, then, which we should like to have answered are, whether the carcinoma appeared as the result of malignant transformation in a benign nasal polyp, or was it a new and distinct growth developing quite independently of the polypi present, and, finally, did the presence of polypi constitute the so-called "precancerous condition"?

The term "precancerous" is one now frequently employed, but there is much that is vague when we attempt to form a clear and comprehensive definition of the term. Undoubtedly there comes a time in the life history of a given normal tissue when a change of some character takes place which renders that particular tissue subject to carcinomatous invasion. But just what is this change and how is it to be recognized? Could we answer these questions, we might be able to prevent the actual developement of cancer in this prepared field.

As to the exciting cause of cancerous growth, pathologists generally agree that it is due to some form of trauma or irritation. A common example is that of "smoker's cancer" of the mouth, believed to be the result of long continued irritation caused by the hot pipe stem resting against the lateral wall of the mouth. Granted that such an irritant does produce cancer in the case of a few smokers, how do we explain the non-appearance of such malignant change in the thousands of other smokers whose mouths remain in a normal, healthy condition throughout the lifetime of the individual?

In the case under consideration in this paper, we are not able to prove that the tissue studied and found to be carcinomatous,

was originally an ordinary, benign, nasal polyp. Since pathologists in general find that cancer practically never develops in noses which may have harbored polyps, repeatedly removed perhaps, we may safely conclude that the mere presence of nasal polypi does not constitute a "precancerous" condition.

In spite of the vast amount of study devoted to the solution of the cancer problem, cancer is still a problem—there is still so much to be explained. We are still leaning on theories while the search for facts as to the actual changes taking place in the development of malignancy goes on.

Davis, in an article on "Carcinoma of the Breast," sums up so well in a few words, our present knowledge of the pathology of cancer, that I quote the following paragraph.

"Cancer cells are recognized only by their behavior. It is impossible yet to distinguish cancer cells from normal cells except by their environment. Since this is so, who can tell the moment the benign cell ceases to be benign and becomes malignant? Who can tell whether the cell, before it breaks through the basement membrane, is malignant or benign? Is the cell innocent before it bursts through the basement membrane, and is it, by the accident of migrating from its former and natural epithelial environment and getting into the surrounding connective tissue, converted into a cancer cell? Pathologists seem to believe that the cell has become malignant before its migration, and that this fact explains why it breaks away from its former environment; but the microscope recognizes it as a normal cell until it changes its habitat."

It is to be hoped that the various societies organized for the study of cancer, will, in the no distant future, make such discoveries as to enable them to answer the many puzzling questions concerning cancer.

The Lenox—13th and Spruce.

OPTIC NEURITIS, SECONDARY TO SINUS DISEASE, WITH REPORT OF A CASE.*

Dr. Isaac B. High, Reading, Pa.

Few results in surgery are as impressive as the restoration of sight, in those who have temporarily been afflicted with blindness. Unmistakable evidences of the favorable outcome of operations upon the sinuses have been furnished by numerous men (Posey[2], Holmes[3]) "so that one can reasonably conclude that in cases of Optic Neuritis where all other causes have been eliminated, except the involvement of these sinuses, operation upon them will prove successful in a large proportion of cases, provided the neuritis has not extended over too long a period". Smith[1].

(Quoting H. Smith): In my opinion it is unquestionably a justifiable procedure to operate on these sinuses when every possible other cause of the neuritis has been eliminated even when there is no local or intra-nasal evidence of the existence of an empyema (I Ibid).

Such interference may be justified as an exploratory operation, when performed by one familiar with the anatomy; it is without danger to the patient and the danger is as a matter of fact negligible as an exploratory procedure, that is, if there is no existing empyema and no underlying constitutional condition contra-indicating an operation.

The mere depletion incidental to the operation will in itself prove of value if the neuritis be due to the pressure of a diffuse inflammation.

White[4], X-ray findings were positive in 7 out of 20 cases (his series). When X-ray findings, however, were negative and he had symptoms of sinus disease, he went ahead and explored. He did not think it safe to allow these patients to go ahead without operation, the operation in itself not being dangerous, but it was a dreadful thing to be blind.

Grayson[5], where symptoms such as post nasal catarrh, remittent headache, associated with mental hebetude and impaired nutrition, are present, for which no local or systemic cause can be found, one is justified in removing the middle turbinate and making a serviceable opening into the ethmoidal sinus through the anterior wall.

*Presented at the May, 1923 meeting of the Philadelphia Laryngological Society.
Accepted for publication, July 23, 1923.

White[4], in sinus disease affecting the vision operation must be done early if sight is to be restored or saved.

Onahi[6], pressure either upon the nerve itself or upon the nutrient vessels supplying the nerve will occasion visual disturbances, so that relief of pressure, whether due to empyema, periostitis or hyperemia from nasal congestion is the object to be attained by the rhinologist. This can be done only by operation. It has been argued that milder operative measures or treatment would effect the same purpose and deplete congested areas but in practice such procedures do not prove very efficient or beneficial.

PATHOLOGY.

It has been demonstrated that the optic nerve presents no constant anatomical relation to the sphenoid sinus and posterior ethmoid cells and it oft times runs through these sinuses with or without any bony covering. Direct infection would be most likely to occur in an empyema of the sphenoid sinus when the nerve runs unprotected through the sinus.

Murphy[7], Upon cross section of frozen specimens the vessels and nerves that run to and from the orbit are protected by a fairly thick bony wall of the sphenoid sinus. In some cases, however, the protection is lost or not as complete as is generally seen and in these cases there can be no doubt but that there is a direct relation between sphenoid, ethmoidal suppuration and retrobulbar neuritis.

White, 1921, says, "The intimate relation of the sphenoid sinus to the optic nerve is a predisposing factor to retrobulbar neuritis." White, 1922, says, "I believe that the anatomical relations of the sphenoid and ethmoid cells are immaterial when it comes to optic nerve involvement. The trouble is due to transmission from soft tissues alone.

The various types of accessory sinus disease causing disturbance in vision are classified as:

Those due to (1) A direct spreading of the infection from the sinus to the sheath of the optic nerve.

(2) To a toxemia from infection in the sinuses.

(3) Hyperplasia of the sinus lining which is defined (Skillern[8]) as a rarefying ostitis associated with an inflammatory swelling and fibrous thickening of the mucous membrane lining the sinus. (That hyperplasia of the lining membrane of the sphenoid sinus plays an important part in causing disturbances of vision was determined by White who in a series of 17 cases found hyperplasia of the middle turbinate to be the predominating pathology).

Tunis[9], The amount of mucous membrane between the optic nerve and sphenoid sinus varies from 1 mm. up to 1 cm., from which it would seem that infection of the optic nerve occurs more readily from continuity and proximity rather than through the lymphatics as there is practically no distribution of lymphatic structure between the sphenoid, the ethmoid cells and the optic nerve, which would cause an extension of inflammation from the sinuses to the optic nerve by the lymph stream.

Posey[2], The optic nerve may be affected through diseased sinuses by contiguity of tissues from all stages of edema to retrobulbar neuritis.

Most cases of retrobulbar neuritis, particularly those uni-lateral in type, have their origin in disease or suppuration of the sphenoid sinus.

Holmes[8], says 40 per cent of eye diseases have their origin in diseases of the nasal sinuses.

Mendel[10], In 12 of 17 cases of unilateral optic neuritis Mendel found the accessory nasal cavities were the seat of the trouble, and it is generally the sphenoid and posterior ethmoid cells that are involved; for medical literature shows only a few rare and isolated cases in which a neuritis occurred as the result of either a frontal or maxillary sinusitis.

That the sphenoid or ethmoid cells when diseased caused an optic neuritis was recognized as early as 1892 when Caldwell reported a case of optic neuritis due to sphenoid and ethmoid disease, and Krauss in 1895 reported 3 cases of retrobulbar neuritis, supposedly due to an extension from sphenoid sinus disease.

Bryan[11] (Quoting Friedenburg) says that sinus inflammations may be grouped under 3 divisions as regards their effects upon the orbit.

1. Those in which a distension of the sinus with inflammatory exudate encroaches upon the space of the orbit causing exophthalmos, limitations of mobility, and interference with sight.

2. Those sinus diseases in which the inflammation extends to the orbit by lymph or blood channels and causes orbital cellulitis or abscess, or optic phlebitis of the orbital veins with an involvement of the optic nerve, by extension of the inflammation or pressure upon the nerve by the exudate.

3. The third type of inflammations, which cause no orbital symptoms or inflammatory reaction at all but where the symptoms are subjective, owing to a loss of the central field of vision.

Stark[12], Classifies the pathology of retrobulbar neuritis as the result of sinus disease as of two types:

1. Infection of one or more of the nasal sinuses, usually the posterior group, with interference of drainage through the natural opening caused by anatomic obstruction or swelling. This condition may exist for years and result in thickening of the mucous membrane, the development of a periostitis, an osteo-sclerosis (or thickening), osteoporosis (or thinning of bone) which condition is commonly known as an hyperplasia. He advances a new theory as to the pathology of sinus disease, i. e., the sensitization of the tissues of the sinus by bacterial proteins producing an allergy, resulting in a localized anaphylactic reaction each time the individual comes in contact with a fresh infection of the nose; which together with any variation in the normal anatomy of the nasal sinuses brings them in closer relation to the optic nerve, resulting in an optic neuritis.

DIAGNOSIS.

Van Der Hoeve[13], Speaking from the ophthalmologist's side, says that the characteristic symptoms of retrobulbar neuritis are: 1. Central scotoma, and 2. Enlargement of the blind spot. Both symptoms are very important and we know with certainty they can be caused by sinus disease and cases are on record where enlargement of the blind spot as well as central scotoma were found, which decreased or vanished by treatment of the sinus affection and came back with every recurrence of sinus infection. Important as are scotoma and enlargement of the blind spot, they are not symptoms of sinus disease but of optic nerve affection. They show us that the optic nerve is diseased but they teach nothing of the origin of the infection; and we must consider that every retrobulbar neuritis may begin with these symptoms whether due to multiple sclerosis, syphilis, tuberculosis or rheumatism. The conclusion arrived at is: 1. That the ophthalmologist has in the eye no sign to distinguish the origin of a retrobulbar neuritis. All cases should be submitted for X-ray examination by a radiologist experienced in sinus work. But even the X-ray is not infallible so that in the presence of retrobulbar neuritis the only satisfactory method to exclude suppuration of the posterior ethmoid cells and sphenoid sinus is to operate upon and open them up. The second conclusion arrived at is that the rhinologist "cannot with absolute certainty say that a person does not have sinus disease".

The frequency of eye disturbances in sinus disease cannot be doubted as Birch Hirschfeld in 604 cases of orbital inflammations found 409 that were due to sinus disease.

While acute sinus affections may cause ocular distrubances, it is generally the chronic type of inflammation in these cavities that results in optic neuritis. Diseases of the anterior group of sinuses cause affections of the bulb; while those of the posterior group cause retrobulbar neuritis, but owing to their anatomical irregularities it is almost impossible to tell which has the greatest influence in bringing about the serious disturbances of the eye and optic nerve when they are the seat of inflammations.

Gallaher [14], Reports but 4 cases of optic neuritis as the result of maxillary sinus infection in literature.

The diagnosis must be considered from two angles—1. The eye symptoms, and 2. the pathology of the nose.

The eye symptoms are generally the first to call attention to the trouble, and it depends on whether the eye involvement is slow or pronounced. Where the involvement is sudden and pronounced the diagnosis can be made more readily than if the symptoms are slow and progressive.

From a nasal standpoint we must not expect to find the common symptoms of sinus infections such as pus, polypoid degeneration, or history of nasal discharge, as we are dealing with a closed in sinus. When you have a deflected septum and a middle turbinate tightly pressed against the lateral wall, you have pathology enough to cause optic neuritis. White in a series of 33 cases found a deflection of the septum, pressing upon the middle turbinate, with hyperplasia of that part, as the most important pathology. Given a case of optic neuritis usually unilateral in type, one is justified in suspecting it to be a complication of sinus disease, particularly the posterior ethmoids and sphenoid. Optic neuritis due to (1) a direct spreading of the infection from the sinus to the sheath of the nerve is diagnosed by rhinoscopic examination and X-ray findings, (2) as are also those cases of toxemia from infection in the sinus. (3) Optic neuritis as a result of an hyperplasia is very difficult to diagnose as rhinoscopic examination reveals little and X-ray studies very often are negative. In such cases when all other possible causes of neuritis have been eliminated one is justified in operating upon the posterior ethmoids, and sphenoid even when there is no local intranasal evidence of sinus disease.

PROGNOSIS.

With regard to prognosis, Van Der Hoeve[18] classifies optic neuritis secondary to sinus disease into two types. 1. Reparable and 2. Irreparable. 1. Reparable caused by toxins, edema, stasis, slight inflammations, slight pressure, for which with proper treat-

ment the outlook for improvement or recovery is favorable. 2. Irreparable because of the longer duration of the disease, and greater extension of inflammation. Even with treatment the outlook is decidedly unfavorable. Briefly speaking, the prognosis depends upon:

1. The length of time before the patient presents himself for medical attention.

2. The degree of disturbance in vision or blindness when the patient presents himself.

3. The promptness with which such a case is diagnosed and treated.

Gallaher[14] says that as atrophy of the optic nerve can occur in from 15 to 20 days, examination should, therefore, be made promptly and no time lost before instituting operative procedures.

A patient with an optic neuritis is in a critical position, for his vision depends upon the promptness with which his condition is diagnosed and his sinuses operated upon. Spontaneous recovery sometimes does occur but it is not to be depended upon.

RESULTS.

White cites 25 cases. 2 (duration of blindness 1-4 days) of which recovered under local treatment; 5 operated upon during the first week, showed complete recovery; 5 operated upon during the second week (two with recovery to normal, three with return to half vision); 4 operated upon between the second and fourth weeks (1 normal, 3 improved); 4 operated upon between the first and second months (2 normal vision, 1 improvement, 1 optic atrophy, no improvement); 5 operated upon, duration over two months, in which 3 showed slight improvement, two no improvement.

As to how long the patient may have the neuritis and when he will present himself for treatment are factors beyond the control of the rhinologist, but when he does present himself diagnosis should be made as speedily as possible, by all methods at our command, and operation advised and undergone as early as possible.

As regards treatment, Bryan[13] says there is no one operation that is suitable to all cases. The more conservative methods have relieved many serious cases, and, conditions justifying it, the intranasal procedures should be tried first, failing which then one of the more radical measures will have to be adopted. Few rhinologists are in favor of conservative measures. The majority favor prompt and radical removal of deflected septa, pathological middle turbinates, posterior ethmoid cells and wide opening of the sphenoid sinus. Patterson[15].

Case referred from Wills Eye Hospital—on the service of Dr. Burton Chance.

Diagnosis: Optic Neuritis.

Age 50, male, clerk. Complains of pain over left eye and temple; vision is becoming dim especially in left eye. Wearing glasses past seven years, present glasses two and half years. Broad, flat cicatrix on left cheek—result of burn when three years old. Slight degenerate arcus senilis. Iris active.

R: Healthy Fundus .

Left Disc: Real fundus off color, disc is rather pale pink, surface not sharply defined. Broad, central cup, edges of which run into disc, substance and vessels curve over in that region. Slight absorption of epithelium, veins quite dark, arteries somewhat narrowed and exhibit sharp reflex—interrupted central pulsation.

September 13, 1922. O. S. No central vision. O. D. +50+37 ax 105=5/6.

Diagnosis: Neuroretinitis with fresh hemorrhage in line of temporal surface. Arteries of orbit are destroyed, surface blurred and vascular.

Wassermann: Negative.

September 16, 1922. Iris reaction preserved, not as marked headache as on first visit to hospital.

Right disc is losing surface markings and outline is blurred, vessel lines blurred—no new extravasation.

Left. Nothing new is to be found.

Ordered sinuses radiographed.

September 19, 1922. Nothing observed at 6 feet.

He sees objects better than he did a week ago.

Right. Nothing of especial interest to note.

Left. Distinct swelling and recent extravasation of blood up and out from the disc.

September 20, 1922. Right. 6/9. Left. 6/30.

September 22, 1922. Right. 6/9. Left. 6/30. Fundus shows marked reduction of edema of nerve head.

September 23, 1922. X-ray report: X-ray shows:

1. Frontal sinuses clear.

2. Exudate in ethmoidal cells both sides, but particularly the left.

3. Blurring and haziness of left maxillary sinus. Not sufficiently dense to warrant definite diagnosis of exudate.

4. Sphenoid sinuses clear.

September 23, 1922. Sent to Ear, Nose and Throat Clinic, Dr. Coates, Medico-Chirurgical Hospital.

September 25, 1922. Rhinoscopic examination reveals left sided cystic middle turbinate, posterior ethmoiditis. Antrum puncture (left) negative. Sphenoid shows no pus, but a gritty feeling of hyperplasia on probing. Would suggest submucus resection, removal of middle turbinate and enlarging of sphenoid ostium.

Patient was urged to undergo operation as soon as possible by Dr. Chance and reported September 27, 1922, at which time the septal deviation was corrected, the middle turbinate and posterior ethmoidal cells removed and the anterior sphenoidal wall punched out, under cocain-adrenalin anesthesia.

Eye examination three days following operation showed vision improved to nearly half. Subjectively the patient said his sight was greatly improved, he could see fingers clearly, also objects from across the room. Right. Vision 6/6. Left. Vision 6/15. Papilloedema subsiding.

Examination ten days following operation showed a return of the eye to normal as regards extravasation of blood, and scotoma; with perfectly normal vision.

Since operating upon the case reported, it has been my good fortune to have seen two other cases of eye involvement secondary to sinus disease.

One of optic atrophy referred by Dr. Chance from Wills Eye Hospital. Rhinoscopic examination revealed moderate deviation of septum to left, left turbinate hyperplastic, sphenoid showed nothing abnormal. On operation, the middle turbinate was removed, posterior ethmoids exenterated and sphenoid ostium enlarged. Two days following operation, eye examination showed very little improvement. The man living in Western Pennsylvania, we have had no further reports.

Italian, female, age 20. Diagnosis, optic neuritis. Hemorrhage into disc, veins congested. Fundus hazy, blurring.

Rhinoscopic Examination shows deviated septum left side, hyperplasia of middle turbinate, some pus between septum and turbinate. Unable to probe sphenoid. Patient refused operation.

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*Read by invitation before the Philadelphia Laryngological Society, April 2, 1923. This paper was prepared as part of the Second Year work in the Department of Oto-laryngology, Graduate School of Medicine, University of Pennsylvania. The cases studied were on the service of Dr. George M. Coates, Professor of Otology, and the work done in the Medico-Chirurgical Hospital.

227 North 6th St.

ETHMOIDITIS.*

DR. WILLIAM FREDERIC MOORE, Philadelphia.

A. B., age 10 years. Referred for swelling of anterior cervical glands on right side of neck.

Family History: Negative.

Past Medical History: Poison ivy three (3) weeks previously which involved the face, especially the lower lids and inner canthus of both eyes.

Examination: Patient complained of stiffness of neck, and head was drawn forward and to right side. Temperature 104. Pulse 120. The nasal pharynx was clear; the tonsils and adenoids having been removed completely in 1917. Trans-illumination showed no abnormality in the frontal or maxillary sinuses. The child was at once placed in bed. Local applications were used on the neck, and calomel administered, followed by a purge. The swelling decreased, and the child was apparently normal in three days. He was then taken to the seashore. Immediately the temperature, pulse and respiration were increased. The appetite was markedly affected, and he took very little interest in his surroundings, complaining again of stiffness of the neck. Dr. Leighton Righter, had him under observation for four days. No abatement of symptoms, and a continued high temperature led me to advise his being brought to the Jefferson Hospital.

No positive diagnosis had been made, but his physician observed that at one time there seemed to be a slight edema of the mucous membrane overlying the anterior pillar on the left side. This was not present at the time of admission. Temperature at this time was 101, pulse 90 (increasing to 100), and respirations 29 (increasing to 30). The swelling of the glands had returned, and there was tenderness on pressure of the right side of the neck; also some tenderness of the roof of the mouth back of the incisor teeth.

Dr. E. Q. Thornton made a complete physical examination, which revealed nothing to account for the symptoms, and advised laboratory examination. The urine findings were never significant. A trace of albumen was always present. The specific gravity ranged between 1008 and 1020.

On June 28, 1922, Hgb. 100%; RBC 4,490,000; WBC 6,400; CI one; PN 57%; SM 27%; LM 15%; T 1%; E zero; B zero.

On June 28, 1922, cultures from the throat and nose were negative for bacillus diphtheria. The throat cultures showed mixed

Accepted for publication, Jan. 5, 1923.

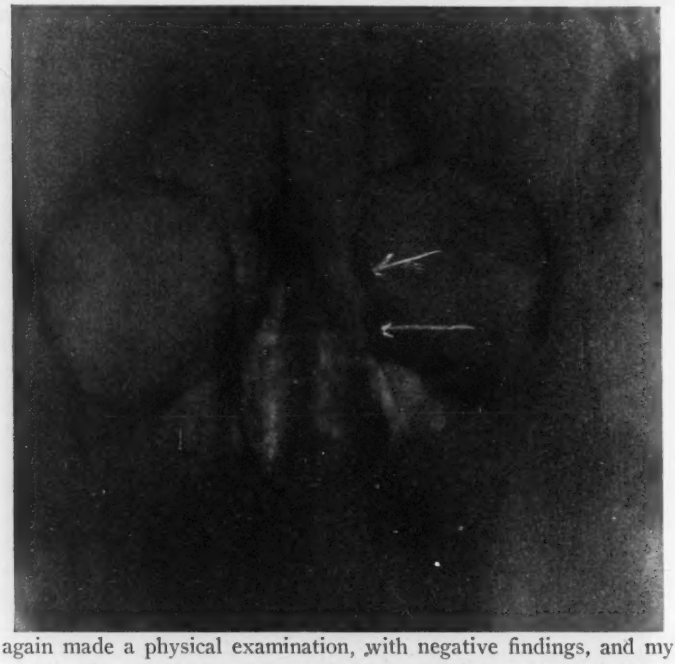
growth of streptococcus and pneumococcus. The nose cultures also showed a mixed growth of streptococcus, with a micrococcus catarrhalis, the latter predominating.

By reason of the fact that he was suffering from giant urticaria twenty-four hours after first admitted, the question arose as to whether the condition of the mucous membrane of the throat before noted was part of the picture. He was very thoroughly tried out by Dr. A. R. Vaughn and reacted strongly to egg albumen. This condition cleared up quickly and did not recur after this was removed from his diet.

Red mercuric iodid, in one-three hundredth grain doses, was given the second hour. Local applications were applied to the neck, and the patient was treated symptomatically for four days. On the last two, temperature being normal, it seemed wise to again allow him to return to the seashore. During this second period of eight days away from the hospital he was very carefully observed by his father, a physician, and Dr. Righter. Inside of a few hours after his arrival on the coast the previous chain of symptoms recurred, except that the glands on the left side of the neck this time became involved.

The child was evidently quite ill, and lost weight rapidly. It were useless to recite the course of treatment instituted at this time, as nothing seemed helpful, and the temperature varied without any regularity, attaining each day at least 102.

Treatment producing no abatement of the symptoms, and the temperature continuing, in a child rapidly emaciating, it was considered advisable to again bring him to Jefferson Hospital. On admission temperature was 102, pulse 120, and respirations 26. Dr. Thornton



again made a physical examination, with negative findings, and my examination of the ears, nose and throat revealed nothing helpful.

On July 8, 1922 the Hgb. was 45 per cent; RBC 3,730,000; WBC 7,800; CI .6; PN 49 per cent; SM 41 per cent; LM 7 per cent; T 0; E 3 per cent; B 0.

On July 10, 1922 the Hgb. was 65 per cent; RBC 3,910,000; WBC 8,800; CI .8; PN 50 per cent; SM 36 per cent; LM 8 per cent; T 2 per cent; E 4 per cent; B 0.

On July 14, 1922 the Hgb. was 63 per cent; RBC 3,850,000; WBC 7,600; CI .8; PN 48 per cent; SM 46 per cent; LM 4 per cent; T 0; E 2 per cent; B 0.

The WBC were on July 10, 1922, 8,800, which was the highest recorded. Otherwise the blood findings were negative.

A Widal test at this time was negative for typhoid fever.

The urine continued only to show a slight trace of albumen.

On July 11, 1922 an examination of the foeces revealed no ova or parasites, and again the next day, the examination was negative.

On July 9, 1922 a streak of muco-purulent secretion was noted following the posterior wall of the nasal pharynx, back of the left posterior pillar.

This suggested for the first time the possibility of an ethmoid or sphenoid infection. A ray was immediately made, and Dr. Manges observed a cloudiness of the left ethmoid cells; the other sinuses being clear. At this time the temperature was normal, and the child bright and cheerful. Appetite had returned, and he was gaining rapidly. Whisky was given as a tonic, and the nasal pharynx irrigated. The patient soon left the hospital, and there has been no recurrence of the trouble up to this time. Another X-ray taken Oct. 4, 1922, shows the ethmoid cells in a normal condition.

The points of interest in this case of ethmoiditis were the difficulty in making a diagnosis, due to the vague symptoms in a child; the extreme prostration and rapid emaciation, with the fact that each time the condition was aggravated by a sojourn at the seashore, and alleviated almost at once when he was brought to Philadelphia; the involvement of the anterior cervical glands, first on the right and later on the left side; the question as to whether or not the edema noted in the throat was part of the urticarial picture, or due to the sinus involvement.

Is it not reasonable to assume that there was a primary involvement of the deep cervicals which drain this region? If for any reason this becomes blocked a reversal takes place in the lymph circulation, either throwing the infection to the superficial chains from the primary seat of infection, or through the efferent spaces connecting the two chains from the deep to the superficial.

In this case soreness and stiffness of the neck column was present, even at times when no anterior cervical enlargement could be demonstrated. Evidently there was a long continued infection of these glands which could not be demonstrated. The important thing then to be remembered in all these cases of superficial cervical glandular enlargement, especially in children, is that in many instances where a diagnosis is difficult, and especially where there is no source of infection apparent about the buccal cavity and regions which are usually supposed to be drained by the superficial lymphatics, an infection of the accessory nasal sinuses must be suspected, especially the ethmoid and the sphenoid.

255 South 16th Street.

TREATMENT OF PARA-NASAL SINUS DISEASE IN INFANTS AND YOUNG CHILDREN.*

DR. L. W. DEAN, Iowa City, Ia.

What I have to say regarding the treatment of para-nasal sinus disease in infants and young children applies to the treatment of this condition in Iowa. Our moist, changeable winter climate is a very prolific producer of para-nasal sinus infections. It prevents a cure in many cases of chronic sinusitis. Certainly para-nasal sinus disease is a different thing in Iowa than in Tucson, Arizona. Cases which do not respond to treatment in Iowa improve as if by magic if the patient goes to Arizona.

In short, the thing which has the greatest bearing upon the prognosis in chronic para-nasal sinus disease in infants and young children is the ability of the patient to seek a proper climate. Naturally, this is the most important thing in the therapy.

The second most important thing in the treatment of para-nasal sinus disease in infants and young children is diet. Dr. Amy Daniels, the Research Dietitian in the Department of Pediatrics in the University of Iowa, has expressed her opinion regarding this matter as follows: We have observed that animals fed diets quite lacking or very low in the so-called fat soluble vitamine ("Vitamine A") are subject to para-nasal sinus infections, a condition which precedes the eye manifestations—Xerophthalmia—characteristic of animals fed diets low in this vitamine. In such animals, the addition of substances, butter fat, cod liver oil, leafy vegetables, etc., which are rich in Vitamine A, corrects the condition if dietary therapeutics are inaugurated in time. Whether or not the para-nasal infections in children are infections superimposed on an undernourished condition, the result of diets low in the fat soluble vitamine, is not clear. It is significant, however, that in general, those babies in our ward who had mastoiditis, were babies receiving feeding formulas low in fat, carrying from 1% to 1.2% on the total mixture. Whereas those infants receiving diets carrying a fairly high percentage of *available* fat, from 2½% to 3%, have shown no signs of mastoid infection.

When a child has a para-nasal infection, diet alone cannot correct the condition. The source of the infection must be removed first

*Read before the New York Academy of Medicine, Section of Laryngology, Februarp 24, 1923.
Accepted for publication, Feb. 22, 1923.

and then proper dietary regimen instituted. Excepting for babies, the diet should contain a fairly liberal amount of butter, vegetables, fruits, milk, eggs and cereal foods. In so far as possible, all fat given should be supplied in the form of butter or cream. Succulent vegetables—at least two servings a day, and fruits—more especially orange juice, should be used freely since these furnish the antineuritic vitamine necessary for appetite stimulation. The amount of carbohydrate foods should be limited for there is a tendency to the use of too much bread, potato, and cereal in the diets of most children. To make sure that there is a liberal amount of the fat vitamine being supplied, cod liver oil once or twice a day is also given. *In cases of this sort it is essential to see that the diet prescribed is taken.* Children have food prejudices and frequently choose those foods, more especially the carbohydrates, to which they are accustomed.

Dr. George Smith, the assistant professor of Bacteriology in the Yale Medical School, working with Dr. Isabel Wason, has come to the conclusion that there is in deficiently fed animals definite evidence of a disturbance in antibody formation that is bactericidal substances and opsonins. They feel that these changes are indirect being dependent upon a modified cellular activity induced by failure to provide a proper regimen.

Dr. Lambert, Professor of Pathology in the Yale Medical School, working with Dr. Yudkin, came to the conclusion that the experimental Xerophthalmia produced in rats fed on diet deficient in fat soluble Vitamine A are essentially inflammatory and are obviously bacterial in origin. His idea is that such animals by a faulty diet are rendered particularly susceptible to infection. He further says that it is interesting and difficult to understand why the infection should involve particularly certain tissues like the conjunctiva and, as we have found in Iowa, the para-nasal sinuses. He also says there may be other infections which have been overlooked. He further calls our attention to the fact that on a different kind of deficient diet which Dr. Underhill has employed in dogs in an effort to reproduce pellagra experimentally, a very different infection, namely, a widespread and severe stomatitis and pharyngitis is brought about, all of which Dr. Lambert feels, points to a possible relation between diet and infection.

In bringing these matters to your attention I do not wish to give the impression that because at Iowa it has been found that rats fed on a defective diet, one deficient in fat soluble Vitamine A, developed in every case an infection of the para-nasal sinuses and that this

infection has not been found in any normal rat or in any rat fed on a diet deficient in calcium when experimental rickets has been produced, that it is the absence of the fat Soluble Vitamine A in foods which is responsible for the presence of para-nasal sinus infection in infants and young children. I do feel, however, that all these observations we have cited suggest that errors in diet play a most important part in causing para-nasal sinus infection in this class of cases and correction of errors of diet is a most important therapeutic agent. I have taken a half a dozen cases of para-nasal sinus disease chronic in infants and young children from three to seven years of age and after doing everything that we could do from the rhinological standpoint for these patients, we have turned them over to Dr. Daniels for feeding with a most remarkable improvement not only in the para-nasal sinus disease but in the outlook of the patient. These patients remain in our own ward under the same conditions which had previously existed and the same treatment was continued. The only difference was the change in diet.

Dr. Albert H. Byfield, head of the Department of Pediatrics in the State University of Iowa, says: The following is a brief outline of my opinion with regard to the part that food and nutrition plays in chronic nasal sinus infection.

In the prophylaxis of focal infection, a proper state of nutrition plays no small part. It is a matter of personal experience that infants and children who are poorly nourished are most subject to nasal sinus infection and in them cure is the slowest. In those older children in whom I suspect chronic nasal sinus disease, I find usually distinct evidence of past or present rickets, or at least faulty development of the skeleton, including the bones of the face.

I think it may be safely said that it is only in the exceptional case that diet of itself can cure sinus infection. Other factors, such as operation, post-operative local treatment, climate, state of atmosphere of room or home and general hygienic measures are of the utmost importance. In treating children with chronic nasal sinus disease, we try to see that the diet contains those substances essential to nutrition. Between a pint and a half, and a quart of milk a day, an abundance of green vegetables and eggs in moderation together with fruits make the nucleus of the diet. Cod liver oil at times seems to be of service. Constipation must be avoided partly through diet and partly by encouraging regular habits. At times the digestion of these children is poor and we attempt to meet the situations as they arise. Coated tongue and loss of appetite are not uncommon and are often times obstinate. We are now consid-

ering the possible harmful effect of a diet too rich in carbohydrate. The results of this will be known at some later date. In concluding, I can say that the human animal, like the young of other species and plants, resists bacterial parasitism best when in a state of proper nutrition. In the case of infection already present, a proper diet is essential but will of itself not produce a cure.

In addition to climate and diet proper hygienic conditions as to dress, foot wear, the living and sleeping rooms, is of importance.

Certainly in acute para-nasal sinus disease in infants and young children, bed rest, diet, ventilation of the room and sunlight are the essential things in its treatment. This with a hot nasal irrigation followed by dropping into the nose some penetrating antiseptic as argyrol or mercurochrome plus perhaps suction treatment is all that is usually necessary.

In every case of chronic nasal sinusitis, diseased tonsils and adenoids if present must be removed. In one eighteen months old baby with a posterior cleft after the removal of adenoids the most persistent treatment for two months would not obliterate a hemolytic streptococcic sinus disease. The tonsils were diseased. It was considered unadvisable to remove these before closing the posterior cleft because of the contraction of the pillars of the fauces. As the cleft could not be closed until the sinus disease was cured the tonsils were finally removed. Following their removal the nasal sinus disease rapidly disappeared and the posterior cleft was readily closed.

Eighty per cent of our chronic cases of nasal sinus disease in infants and young children have been cured by the removal of tonsils and adenoids without any other treatment. These favorable results I feel are due in great part to first, the age of the patient excluding long chronicity; and second, the comparative infrequency of nasal obstructive lesions in this class of cases. While nasal obstructive lesions in infancy and early childhood are not common, they, sometimes, are present and are important etiological factors in the production of the sinus disease. In such instances this condition must be corrected if the work can be done without interfering with the development of the nose.

In our cases of chronic sinusitis if the patient remains in Iowa, the prognosis is bad so far as a cure is concerned unless the case responds to the removal of tonsils and adenoids together with simple after treatment. I think almost all of our cases leave our service with clean noses, clean sinuses and apparently a fine result. A

culture taken from these sinuses frequently shows them not healed. We have a social service which follows up these cases, visiting them once a month, even if the patient lives 300 miles from the hospital. The reports from these social service workers show that many of the cases which are apparently well are not in any sense cured. Some cases will go for two or more years and will then have a flare-up. The story is always the same, the patient took cold; nasal discharge appeared, followed by the same complication which the patient had before phyctenular conjunctivitis, asthma, tender joints.

Our largest percentage of favorable results from treatment of the more serious forms of chronic sinusitis are in those cases where it was found necessary to operate. In our experience it is unusual in a young child to have a return of the trouble in a sinus which has been thoroughly operated. It is not unusual to have this patient return with infection of some other sinus. With the exception of the simple meatal drainage of a maxillary sinus we never operate on any sinus until months of treatment have been tried. and it is perfectly evident that something more must be done. I do not hesitate to exenterate the ethmoids and sphenoid in a young child if it is perfectly plain that the infection cannot be removed by simpler methods and that the infection must be removed or the child will be blind, or crippled for life. We have now in our service two children each with multiple infectious arthritis involving all the joints of the body, including the tempero mandibular articulation. There is no doubt but that the source of infection in these two cases is in the para-nasal sinuses. After months of treatment we were unable to get any marked improvement in the arthritis. Following operation on very necrotic ethmoids these children have improved wonderfully, not only so far as the joint trouble is concerned, but their outlook is very much better. It would be difficult to convince the parents of these children, or the children themselves that the operation was not justified. Certainly the pediatrist and the orthopedic surgeon are satisfied with the results. We have in the laboratory the material removed from every case where ethmoidal operation has been done. A study of this material shows that no damage had been done to any child. The necrosis of bone is marked in every case.

An antro-meatal operation is as far as I go with children in operating the maxillary sinus.. The youngest child that I have done an external frontal operation upon was 12 years of age. This patient had a brain abscess involving the frontal lobe of the brain. He

was operated two years ago. I saw him four days ago; while the local result is very fine he has epilepsy.

I cannot tell you how we treat our more severe cases of chronic para-nasal sinus disease. The essential thing is to place them in a hospital, study them daily, have associated with us in the treatment the pediatrist, the metabolism expert, the orthopedic surgeon or the ophthalmologist. We all work together; one kind of treatment and another is tried. A radical operation is only done when some serious systemic or local condition is manifestly secondary to the sinus disease and can only be relieved by the eradication of the sinus trouble.

REPORTING THREE PEANUT CASES IN BRONCHI.

Dr. Morris E. Newman, Buffalo, N. Y.

Case 1. C. C., age 4. History reports that child ate peanuts one week previous to illness which started with cough, some expectoration and at times shortness of breath. On the seventh day youngster was very dyspnoic and starting cyanosis. Bronchoscopy performed through upper route. Youngster stopped breathing for a few minutes but respirations returned by use of forced oxygen by Dr. Evans. Four hours later patient again became dyspnoic and a hurried tracheotomy was performed and much secretion removed by suction through tracheotomy tube. Trachea was aspirated with catheters and suction for many weeks. All attempts at removal of tube failed as youngster would become frantic and cyanotic. A series of plugs were started and finally tracheotomyy tube was completely plugged for three days. On removal of tube, the same experience was noted and tube was re-inserted and cyanosis disappeared and breathing returned to normal.

Laryngoscopy was performed and a subglottic infiltration was seen.

Large doses of Potassium Iodid were given and the plugging

Accepted for publication, Aug. 20, 1923.

procedure repeated. After three such attempts, we were able to leave tube out (ninth week) and patient made an excellent recovery, with practically no alteration in voice or respiration.

Case 2. J. W., boy, age 3. History is that child was perfectly well up to three days previous to present illness. The parents describe attack as beginning with difficulty in breathing and thinking child had a cold paid little attention to it for a few days. This difficulty in respiration increased and on morning of fourth day, child suddenly went into state of coma. Youngster was brought into hospital and a low tracheotomy was performed and on opening the trachea a large amount of free pus exuded. A 5 mm. Jackson Aspiration Bronchoscope was inserted and the pus aspirated. On further inspection a peanut was found in the right bronchus, removed and bronchus was aspirated for fragments. Immediately on insertion of tracheotomy tube, the childr's color and respirations returned to normal. Tube was removed on the third day. Recovery uneventful.

Case 3. F. M., age 17 months. History shows child in good health up to midnight of previous day when child became short of breath and cyanotic. Mother recalled that child had been playing with a bag of peanuts that evening.

A low tracheotomy was performed and free pus exuded from trachea on opening rings. Trachea aspirated through bronchoscope and on deep inspection a peanut was found in right bronchus which was removed and trachea and bronchus cleaned and tube inserted. Removed on third day. Recovery uneventful.

468 Delaware Avenue.

A STUDY OF RETRO-PHARYNGEAL ABSCESS.*

DR. J. A. BABBITT, Philadelphia, Pa.

From the standpoint of basic pathology, the retropharyngeal abscess presents little complexity. Its etiological significance, however, and its so frequently fatal sequence impress both laryngologist and pediatrician.

Its study is primarily the study of lymphatic nodes and channels, and chiefly concerns that period when such structures are most significant, hence its correlation includes the period of thymus activity, the possibly functioning epoch of the Waldeyer ring and the embryonic contribution in tympanic infection. The significance of the Status Lymphaticus is somewhat uncertain in this connection; it indicates as stated by Cooks, referring to Paltauf, a general hyperplasia of tonsillar ring, lymph nodes, lymphatic elements of spleen, arterial system, digestive tract and bone marrow, including persistence or hyperplasia of thymus and predisposition to death from trivial cause.

Strauss discussing the intimate lymphatics of the trachea, cites the early discovery by Von Recklinghausen that lymph spaces and lymph vessels were lined with endothelial cells.

General anatomic description of lymphatic vessels in the head and neck show their termination in the deep cervical chain along the carotid artery and internal jugular. Tributary channels come from orbit, temporal and zygomatic fossa, entire naso-pharyngeal tract and even cerebral and meningeal lymphatics.

As stated by Wood, the retropharyngeal group of lymph nodes consists generally of two glands, back of the posterior pharyngeal wall near outer edge and in close relation externally with sheath of great vessels of neck. Suppuration leads to retropharyngel abscesses. These are in direct communication with the deep cervical nodes. The loose investment of the pharyngeal mucous membrane over an area so directly in the lymphatic path offers an immediate reservoir for purulent collection, and readily explains its frequent pathologic adoption.

Correlating the above facts: A lymphatic system structurally favoring toxic absorption, markedly hyperplastic in all its elements

*Candidate's Thesis, American Laryngological Society, 1923.
Accepted for publication, Sept. 13, 1923.

at the age period most susceptible to retropharyngeal infection, a net work of channels linking cranium, tympanic cavity and naso-pharynx with superficial collar and deep cervical nodes, and leaving beside the great vessel route into the mediastinal space; and finally a sequence history punctuated by frequent and unexplainable sudden death, assigned to asphyxia, inspiration, pneumonia or toxemia—The invitation to pathology is complete but the toll of case reports seems relatively low.

Etiologically, otitic infections extending downward beside the tensor tympani muscle, metastasis from accessory sinus disease and focal infections in the naso-pharynx, seem to have predilection in inciting retro-pharyngeal sequence—this, of course, excluding fundamental leutic types and tubercular origin.

Calvin Rush has classified infected sources as (1, caries of upper cervical vertebrae, usually tuberculosis; (2) suppurative otitis media; (3) carotid abscess extension; (4) infected retro-pharyngeal nodes.

Extensions downward along the Eustachian tube or from accessory sinuses are the frequent sequellae of the exanthematous diseases and traumatic pharyngeal injury.

Dean and Armstrong have enlightened us much as to nasal sinus disease in young children. Levy, in discussion of the origin of naso-pharyngeal polyps, and Beck in histological examination of lateral pharyngeal masses, have added possible etiologic significance.

The suppurative diseases of the middle ear in infancy have absorbed much recent attention, even in such remote conditions as when amniotic fluid is forced up the Eustachian tube at birth and Rivinian segment is deficient. Infective ear conditions from remote thoracic and gastro-intestinal disturbances—even these may be related to the latent, tardily recognized retropharyngeal collections. The course of these burrowing extensions from the ear into the lateral neck and post-pharyngeal wall have been analyzed by Oscar Beck, who also cites the possibility of extradural suppurations in posterior fossa producing burrowing abscesses, settling behind wall of larynx, peribulbar suppurations with usually thrombosis of eye ball, extending along base of skull; and also retro-pharyngeal abscesses.

The sequence in delayed evacuation would be extension downward into mediastinal area through openings for passage of vessels, through blood and lymph streams to meningeal and intracranial involvement, and with the rich vascular field of the carotid and its tributaries, and proximity of venous channels, serious hemorrhage from erosion may result.

Unusual complicating equellae of retro-pharyngeal agscess have been reported, such as the thrombosis of the internal jugular vein with pyemia, by Mosher; and many cases of unexplained sudden asphyxia, probably from inspiration after sudden rupture.

The diagnosis is not always simple and incision without reaching pus is both embarrassing and sometimes dangerous. In older patients, fibromata, lympho sarcoma in naso-pharynx, as cited by Chamberlain, Hall, Fernandez, Stein, Buchanann and others, may simulate the diagnostic signs of post-pharyngeal abscess. In children with contracted pharyngeal aperture, and either lateral, epi-pharyngeal or hypo-pharyngeal displacement, the decision becomes almost empirical and in the last analysis guided by the facies and "duck like" cry.

One personal case of interest may be cited. (Case I), Pauline B., 12 weeks old, admitted to Mary Drexel Hospital in emaciated condition. Respiration and deglutition difficult, with swelling in pre-tracheal region appearing shortly after birth, and gradually increasing in size. Primary indications pointed to retro-pharyngeal mass, as anterior mass was not yet prominent. Digital examination in throat indicated hard mass on right side, variously diagnosed as abscess, displaced hyoid bone, etc. While awaiting developments, the anterior mass, occupying position apparently between diverging thyroid cartilage alae, protruded more in front and with apparent fluctuation. This was needled, then opened and several cubic centimeters of creamy pus was evacuated. Culture diagnosis—streptococcus, not typed. A probe passed obliquely down two inches or more, clearly a patulous branchial tube and one could realize the consequences here of pharyngeal surgery.

Investigation of a special series.

With the assistance of Dr. Campbell, fifty cases of retropharyngeal abscess, occurring in the Children's Hospital and the Mary Drexel Home, in Philadelphia, since 1908, have been carefully reviewed. In this series 66 per cent occurred in the first year of infancy. Brown has reported in his series 50 per cent as occurring during the second six months, and Freedman 33 per cent under one year.

In our series of fifty, eight occurred in the first six months, twenty-five in second six months, thirteen in second year, one each at two and a half, four, six and ten years respectively. Thirty-six were in boys; fourteen in girls. A rather marked difference, but probably not significant. Only ten of the group occurred in colored children and this is somewhat surprising in view of the tuber-

cular susceptibility of the latter. Six cases had definite otitis media at the time of pharyngeal involvement, and eleven marked purulent rhinitis. Eleven had hypertrophied and cryptic tonsils, and fourteen cervical adenitis. Anemia and mal-nutrition was apparently a definite antecedent in thirteen cases, rachitic conditions in but three; complications recorded included:—premature birth (etiological) 1; pertussis, 2; ischio rectal abscess, 1; multiple abscess, 1; gastro-enteritis, 2; celluitis (erysipelas), 1; hereditary syphilis, 1; lobar or broncho pneumonia, 6—spontaneous rupture of abscess occurred in three cases, of which one died. Total deaths recorded were five (10 per cent) one of these was the immediate result of hemorrhage.

In practical significance possibly the justification of prompt and radical care of tonsils, otitis media, and purulent rhinitis is the most important. One has the feeling that the investigation of paranasal sinuses has been insufficient. The basis of mal-nutrition cited by so many authors cannot be over estimated in causative importance. One is impressed, both in review of personal cases and those recorded in literature, with the importance of the relation of retro-pharyngeal abscess to cervical adenitis, and the careful judgment required in surgical procedure. Many cases in our review should obviously have been opened through the neck externally and behind the sterno-mastoid, when anesthetic could have been safely administered and abscess contents neither swallowed nor inspired.

The death rate would seem high, but this included two or three cases entered in serious condition, and one case of spontaneous rupture, discussed below.

Spontaneous Rupture. Frank, discussing the results if abscess is left to itself, cites these as possible, draining into the pharynx, but rowing into posterior lateral triangle of neck, rarely following down beneath clavicle and into axilla, guided by prevertebral fascia (usually cold abscess of cervical and Potts), traveling downward behind esophagus into posterior mediastinum, spreading by blood and lymph streams into meningeal area with general septicemia, hemorrhage by erosion of great vessels in neck, and producing pressure on epiglottis and larynx with edema, perhaps rupturing and causing aspiration of infecting contents with pneumonia, lung abscess or sudden asphyxia. Brown quotes Koplik as never having seen a fatal result in retro-pharyngeal abscess which has gone on to rupture spontaneously, but Bokai, Henock, Goldstein, Peirson and Mauerhaff, as having called attention to similar cases, resulting in death.

The above citations are given as preamble to a case reported in conclusion of this paper.

Case 2. John H., 7 years, sent into Mary Drexel Hospital, April 9 by Dr. Yeager, with glandular mass on left side of neck and history of vomiting blood. Dr. Yeager reports that the boy was brought to his office on March 14 with lump on left side of neck, about level of fifth cervical vertebrum, which had appeared several days previously. Complained of slight cough more than a week. March 22, cough better, lump the same. March 29, no change. April 3, swollen left tonsil. April 5, mother noticed blood on pillow and stools black. April 9, mother noticed more blood and black vomitus. No temperature and heart, lungs and kidneys normal. Patient now moved to Mary Drexel Hospital and placed under my care. Child appeared quiet. No temperature, nor undue rapidity of pulse. Gland in neck much swollen, suggestion of fluctuation. In naso-pharynx much fibromatous clotted material felt, scarcely to be differentiated from adenoid tissue. Found considerable cavity extending beneath softpalate toward left angle of jaw. As child was quiet and apparently little bleeding, decided to leave until morning and await glandular development. Two hours later, resident physician examined him. Everything appeared favorable. Ten minutes afterward, doctor recalled. Patient had vomited considerable blood and died immediately. Dr. Reiman performed partial autopsy the following day to determine cause of death. Found large abscess cavity extending from cervical gland up and out to angle of jaw. Examining probe and finger passed into a second large cavity anterior to this, not communicating and retropharyngeal. A third purulent pocket or channel had extended down along sterno-cleido mastoid to and beneath clavicle. Carotid and jugular not ruptured, but some of large tributaries evidently interiorly ruptured and behind tonsil area. Patient apparently died from asphyxia, or some form of thoracic pressure.

Conclusions:

1. In infants under two years of age, retropharyngeal abscesses should be more frequently suspected.

2. In suspected retro-pharyngeal involvement, para-nasal sinuses and middle ears should be promptly investigated.

3. The para-nasal sinuses have apparently been given too little attention in purulent rhinitis.

4. The external route should be more frequently employed in evacuating retro-pharyngeal abscesses, complicated with cervical adenitis.

5. The source and route of infection is often impossibly obscure.

6. It cannot be considered safe procedure to permit retro-pharyngeal abscess to continue on to spontaneous termination.

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2117 Chestnut St.

FOREIGN BODY IN LARYNX, WITH ABSENCE OF COUGH REFLEX.

Dr. George T. Ross, Montreal, Quebec.

Baby Hilton, aged fifteen months, a patient of Dr. A. E. Vipond, was brought to the Western Hospital, with a history of having swallowed a safety pin.

The baby's condition may be described as absolutely quiescent, placidly noticing the surroundings, no evidence of pain, cough or obstructed breathing. If the statement had not been positively made by the parent that this accident had occurred one might have reasonably concluded from the lack of symptoms that there was nothing physically wrong with the infant. An X-ray plate however, very plainly demonstrated the presence of a safety pin lodged in

Accepted for publication, Oct. 10, 1923.

the larynx, with the point penetrating the posterior wall about the level of the glottis. As the location of the offending article seemed to be within the reach of forceps, I decided to try this means of extraction, using forceps curved on the flat, under general anesthesia. With the left forefinger as a guide this maneuver proved sufficient, for catching the pin and using a slightly downward and forward movement, it was easily dislodged and extracted, without much traumatism.

My object in reporting this case is not only because of the scientific interest in the absence of cough reflex, but because the absence of cough is so very misleading, if the fact is not appreciated, that a foreign body may exist in the larynx or upper respiratory tract and not be indicated by any cough reflex.

The theory of diminished tactile irritability resulting from prolonged presence of foreign bodies in the region referred to, with consequent loss of cough reflex, has been elaborated by Chevalier Jackson in his classical and brilliant work.

In a personal communication with that author he says: "Nearly all of the laryngeal diagnoses in children are, I am sorry to say, made by inference. It is perfectly natural for the practitioner to exclude foreign body in the larynx if the child does not cough, because the practitioner himself must recall how he choked and strangled and coughed, when a crumb of bread or perhaps a few drops of water, got down his larynx accidentally."

Jarvis in his thesis presented last year, has shown how adaptation to occupation, such as stonecutters, produces temporary immunity in the respiratory tract, when dust inhalation is continuous. In this connection also H. C. Jackson's article on "Reflexes from the Respiratory Tract" is especially interesting to those whose work applies to the region mentioned, but the practical point for the physician to bear in mind is the possibility of a foreign body existing in the respiratory tract without cough reflex.

456 Mackay Street.

MUCOSIS OTITIS.

Dr. F. O. Kettelkamp, Colorado Springs, Colorado.

While the common form of acute otitis media is well known, there is another form which is not so familiar, nor so easy of diagnosis—the so-called "Mucosis Otitis". This disease is insidious in its onset, is often most difficult of diagnosis, and is stealthy and treacherous in its course. While a number of observers have found the streptococcus mucosis capsulatis in mastoid and middle ear pus, it would seem that the credit of first recognising this form of otitis as a distinct clinical entity belongs to Professor Gohn, then of Vienna, but now Professor of Pathology at the University of Prag.

For years, it has been the custom of the Neuman Ear Clinic to send a specimen of pus from all mastoid operations, as well as a specimen of spinal fluid from all spinal punctures, to the Pathological Laboratory, in charge of Professor Weichselbaum, for examination. Dr. Gohn, then assistant at the Pathological Laboratory, was especially interested in bacteriology of middle ear diseases, and he had frequently found the streptococcus mucosis capsulatis in specimens of mastoid pus.

It was in 1909 that Dr. Gohn one day received a specimen of spinal fluid for examination, which was sent from the medical ward, with the diagnosis of tubercular meningitis when, upon examination, he found the streptococcus mucosis capsulatis in pure culture. He at once made the diagnosis of a complicated middle ear disease and telephoned the Ear Department that, in bed so and so in the medical ward, was a patient who was doubtless victim of a complicated ear trouble. The internist was naturally quite surprised at this diagnosis, because the patient had never complained of any ear trouble. Death followed next day from meningitis and, at the autopsy, a very extensive bone destruction of both the mastoid and petrous portions of the temporal bone was found. This incident marked a new era in the diagnosis and treatment of these obscure and indefinite middle ear conditions, which hold so unique a position in the science of Otology. The scientific interest of the same to the otologist is exceeded only by the vital interest to the patient whose life, in many cases, depends upon the correct diagnosis, followed by not only proper, but also timely surgical interference.

Although, as mentioned above, the clinical picture and course of

Accepted for publication, March 23, 1923.

acute otitis media is familiar to all, yet for the purpose of comparison I shall briefly review the same here. Generally speaking, the course is usually about as follows: The patient often after an attack of La Grippe, Pharyngitis, Tonsillitis, or after exposure, first observes a sticking pain in the ear, which gradually increases in severity so that after a sleepless night he perhaps seeks relief at the hands of his physician. In this, the first stage, the picture usually is about as follows: The drum membrane is dark red, perhaps bulging, land marks effaced, and the hearing decreased. The patient complains of very severe pain and, if an adult, may or may not have an elevation of temperature; while children in this stage often have very high fever, or even convulsions and, on the whole, they may make the impression of being severely ill.

The bulging of the membrane may be most prominent in the centre, which indicates a mesotympanic type of infection, or it may be most marked in the upper half, which points to an epitympanic type of suppuration. Sometimes we see, instead of the regular diffuse bulging, a teatform protrusion of the drum membrane. This, the otologist dislikes to see, because he knows that such a form of otitis media is often very obstinate in its course and given to relapses. In this stage, the paracentesis is done, not necessarily in the classical posterior-inferior quadrant, but better, at the sight of the greatest bulging. If a teatform bulging be present it should be removed with snare or ear forceps.

As a rule, pus does not appear immediately after the paracentesis is done, but for the first few hours blood and serum only exude. With the beginning of the purulent discharge, the pain subsides the temperature comes down, and the patient enters upon the second stage, the stage of suppuration. This stage usually lasts for two, three, or four weeks, the discharge gradually decreasing in quantity and changing in quality to a sero-mucus consistency. Finally the discharge ceases entirely, the perforation, which can seldom be seen in the acute type of otitis, closes, the membrane gradually clears up, the details again becoming visible, and the hearing returns either spontaneously or after politzerization. This, in a general way, represents the course of the common form of acute uncomplicated otitis media, which as stated above is familiar to both otologist and general practitioner.

For the bacteriology of acute middle ear infection, I shall refer to the work of Professors Neuman and Reutin Arcives of Ohrenheilkunde, 1909. They distinguish in the bacterial flora two large groups, the capsulated and the non-capsulated bacteria. The com-

mon form of acute otitis media, described above is caused by the non-capsulated group. Of these, the most common offender is the streptococcus pyogenous aureus, which usually infects the tympanic cavity and the mastoid cells. The staphylococcus pyogenous aureus and albus are also found in the pus of middle ear infections, but it is still a mooted question whether these germs alone can cause an otitis media. It is certain, however, that in the great majority of cases they are only secondary invaders.

The capsulated group produce a special type of otitis media, which from the clinical symptoms is so characteristic that we speak of it as mucosis otitis, and we mean by this a symptom complex, which may be caused by the streptococcus mucosis capsulatis or one of several other capsulated bacteria. A knowledge of this disease is very important for the otologist, for it may happen that the most experienced be surprised by an intra-cranial complication, the presence of which he never in the least suspected.

The picture of mucosis otitis may be evanescent or vanishing, the symptoms often being very slight and unnoticed by the patient. In fact, he has no idea that he has a serious ear trouble, and least suspects that he already has the gravest kind of an intra-cranial complication fully developed. Upon the insistent questioning of the otologist, however, he will perhaps remember that weeks or months ago he had a slight ear discomfort for one or two days without severe pain or discharge.

Upon examining the drum, one finds little or no signs of inflammation, a gray membrane with details present, or perhaps indistinct. If paracentesis is done little or no discharge follows. The hearing early in the disease may be almost normal, but later is usually decreased. There is usually little or no tenderness over mastoid, but if same is opened, one is amazed at the wide destruction of bone, the sinus, and dura of both posterior and middle fossae often being exposed. If spinal puncture is made, a cloudy fluid will perhaps be obtained, containing the streptococcus mucosis capsulatis in pure culture. The surprising feature of this disease is the far-reaching invasion and bone destruction without commensurate clinical symptoms, without fever, in fact, without any of the cardinal signs of inflammation. It is thought to be the property of the capsular substance of this germ to destroy bone, without any signs of inflammation—like it is dissolved by a chemical substance or similar to the destruction of tissue by a rapidly growing cancer. Fortunately, the course of this disease is not always as severe as described above. The otologist usually has signs from which he can make the diag-

nosis, if the patient comes into his hands suffciently early. We pointed out above that in the common acute otitis media, after stage No. 2, the patient feels the very agreeable sensation of convalescence, the discharge ceases, the hearing returns, and the tympanic membrane again clears up. In mucosis otitis we also have stage No. 1, as in the common type of acute otitis media, though less stormy, pain less severe, and often lasting only a few hours, or a few hours of a few days, as a result, the patient usually does not consult his physician.

After this first stage, we often do not have stage No. 2, the stage of suppuration; nor does the patient come into stage No. 3—namely, when he again feels bouyant, hearing normal, and drum cleared up. He always feels that there is something not normal about his ear—in fact, he is always conscious of the presence of his ear. It is with these indistinct, indefinite complaints that the patient comes to the otologist (if indeed he comes at all before he is beyond help), and it is of the greatest importance that the correct diagnosis be made, because such patients can be helped; but, if the diagnosis is not made, the disease will prove fatal in a large percentage of cases.

The patient will often give a history, if closely questioned, of having had slight or indefinite pains in his ear for a short time, perhaps weeks or months ago, and that since that time he has a strange unnatural feeling in his ear, and perhaps does not hear quite so well as normal. The otoscope will reveal a membrane, often not unlike that seen in catarrhal conditions; oftentimes after repeated careful observations one will see one or more congested vessels on the drum; sometimes a passing oedema of the mastoid process is observed; or a decreased hearing, which is not improved by air inflation. All these signs and symptoms together should cause the otologist to think of mucosis otitis, and he should recommend opening the mastoid bone because we know that mucosis otitis rarely heals spontaneously. In 1909 Professor Neuman of Vienna reported 24 cases, two of which healed spontaneously.

The following case records, taken from the files of the Neuman Ear Clinic in Vienna, are representative of this class of otides:

Case I. P. K., age 64, patient brought to hospital on October 19, 1921, unconscious. Son says that eight weeks ago, father had indefinite ear trouble which, however, disappeared. Two days before entering the hospital, the patient came to the clinic and the physician who saw him made the diagnosis of mucosis otitis, did paracentesis, with negative results. The following night patient sud-

denly became unconscious and had convulsions. *Status Presens*: Right Ear; Tympanic membrane diffusely cloudy; crust at sight of paracentesis. *Left Ear*: Membrane normal; Vestibular apparatus normal. Eye movements are free. Prompt pupillary light reflex; no paralysis; no Babinski; no Oppenheim. Head movements free. Patient has optical hallucinations; sees and converses with imaginary persons; gives impression of one suffering from acute hallucinosis. Three hours after entrance into hospital, pupils became dilated, pulse irregular, and exodus follows. Post-mortem findings: Suppurative leptomeningitis on base and convexity of brain—mostly on convexity. Erosion of entire posterior tympanic wall, with extradural abscess. Also fibrinous pachy-meningitis interna. In the pus of leptomeninges, streptococcus mucosis capsulatis found.

Remarks: This case illustrates the negative ear findings, together with the extensive bone destruction, even exposing the dura. Quite remarkable also is the picture of meningitis, quite extensive and advanced, and still none of the regular symptoms and signs of meningitis present. Patient gave the impression of a psychosis.

Case II. J. K., age 21, Jan. 10, 1921. Patient gives following history: Eight weeks ago patient had peculiar "sticking" in right ear, together with tinnitus and "obstructed" feeling in ear. Last few days has pain in side of head. *Status presens*: Right ear: Membrane red in upper half—not in lower half. The details are unclearly seen; no perforation; no tenderness of mastoid. Whispered voice heard 20 cm.; conversation voice, 1 meter. Left ear normal. Jan. 11—next day, paracentesis (right) followed by air inflation. Small amount of mucus forced out; patient feels better, wants to go home. Discharged, to return for clinical treatment and observation. Jan. 28—two and a half weeks later, patient again enters hospital. Says he doesn't feel well; has headache, frontal and occipital, no appetite, insomnia; drum membrane is slightly red; no discharge, hearing unchanged—whispered voice 20 cm., conversation voice, 1 meter. Operation same day. (Antrotomy). A wide destruction of bone is found with granulations in the mastoid cells. Jan. 30 and 31—(second and third days after operation) patient feels well. Feb. 1—(next day) patient has headache. Feb. 3—(two days later) headache continues, normal temperature; patient looks very pale, looks very sick; change of dressing shows copious discharge. Feb. 7—(four days later) headache continues, temperature 39.1° C. Fundi normal; patellar reflexes increased; no Babinski; no Kernig; no rigidity of neck. Lumbar puncture shows a cloudy spinal fluid containing diplococcus lanceolatus capsulatus in pure culture. Blood

is streile. Feb. 9—(two days later) patient makes better impression. Less rigidity of neck; no Babinski; no Kernig. Feb. 10—(next day) more restless; neck rigidity increased. Feb. 11—(next day) Exodus. Post-mortem findings: Diffuse suppurative meningitis on base and convexity with thick gelatinous exudate on base of right temporal lobe and right cerebellar hemisphere.

Remarks: When the patient came to the hospital, the second time, he evidently already had his meningitis. It is also interesting to note that his trouble seemed so slight that he was discharged from the hospital the first time, when he doubtless already had mastoid involvement. It will also be noted that the offending micro-organisms in this case was not the capsulated streptococcus mucosis, but the capsulated diplococcus lanceolatus.

Case III. H. E., age 42, admitted to hospital March 19, 1922. History: Always healthy. Five weeks ago had feeling of obstruction in right ear. Otologist found normal membrane. Patient felt very well. Eight days ago, patient felt sick with headache. Last three days, headache very severe. Patient was brought to Internal Department with diagnosis of Influenza Encephalitis, there being an epidemic of Influenza in the city. Soon meningeal symptoms were detected, and lumbar puncture revealed a spinal fluid containing streptococcus mucosis capsulatis. The internist at once made the diagnosis of otogenous meningitis, and the patient was transferred to the Ear Department. Patient was unconscious; temperature 37.6 C., all cardinal signs of meningitis present—rigidity of neck; positive Babinski; positive Kernig, etc. Otological examination: Right ear: membrane dull; indifferent; details not clear; paracentesis, followed by suction with Siegle's speculum, produced no secretion or discharge. Left ear, membrane atrophic, shiny and retracted. In consequence of drum findings of right ear, the right mastoid was opened. A very extensive destruction of bone was found, with dura of both posterior and middle fossae already exposed. The bony covering of lateral sinus was also destroyed. The mastoid cells were filled with mucus secretion and granulations. Exodus followed 24 hours later. At autopsy, a diffuse suppurative meningitis of base and convexity was found. The pus shows streptococcus mucosis capsulatis.

Otitides caused by capsulated bacteria, are comparatively rare. Neuman and Ruttin found in 54 cases of spontaneously healed otitis media, 3 cases of capsulated bacteria, and 51 non-capsulated.

The same authors found, in 90 operated cases, 22 caused by capsulated micro-organisms, and 68 non-capsulated. We must reiter-

ate that the capsulated offenders have the property of causing mastoid complications with bony destruction.

Summary: 1. Clinically, we distinguish two kinds of Acute Otitis Media, the common type and the so-called Mucosis Otitis.

2. The so-called Mucosis Otitis need not not necessarily be caused by the streptococcus mucosis capsulatis, but may be caused by the diplococcus lanceolatus capsulatis as well.

3. Clinically, Mucosis Otitis presents a characteristic picture.

4. Capsulated bacteria cause symptomless destruction of bone, and provide symptomless intracranial complications.

5. Streptococcus mucosis capsulatis, found in spinal fluid, is pathogonomic of otogenic intracranial complications.

For the permission to publish these cases, I am indebted to Professor Dr. Neuman, head of the Vienna University Ear Clinic, and assistant, Dr. Franz Fremel, to whom I wish hereby to express my thanks.

215 Burns Building.

VARIX COMPLICATING CHRONIC TONSILLITIS.

DR. WILLIAM HERBERT, Brooklyn, N. Y.

The subject of tonsilar operations has been so thoroughly treated by laryngologists that it hardly seems possible that anything could have been overlooked. Yet the writer has been unable to find anything resembling the case he wishes to report. There may have been reports made on such a case as this one after all but he has not found them. This case does in no way suggest any operative technic but rather approaches the subject in such a way as to emphasize the importance of the operation. It is too often classed a minor affair. It is taken altogether too lightly by the average physician. It is attempted too often by the inexperienced and incompetent. In the hands of the skilled operator tonsillectomy does appear as being simply done and thus the unskillful observer attempts to do likewise.

A. W. B. presented himself at my office for examination, giving a history of repeated attacks of tonsillitis. Examination of his

Accepted for publication, Nov. 8, 1923.

throat showed a large pair of badly infected tonsils. The young man gave a history of having been operated upon when very young for the removal of his tonsils. At the time of the operation he was wrapped in a sheet and without any anesthetic an attempt was made to remove the tonsils. The attempt was a complete failure, as far as the removal of the tonsils. The right tonsil at the time of my examination was complete, but the left tonsil appeared as though it had been split in two and the lower half having been separated from from the upper had dropped down into the throat. This mass was not pedunculated but had a large base. The lower half was soft and lacked the firmness of the upper portion. The appearance was also different, having a blue hue. A local tonsillectomy was suggested and the patient referred to the hospital. At the time of the novacain injection an exploratory puncture was made into the mass to determine if it was a varix and upon removal of the needle a stream of blood spurted from the site of the wound. The wound was clamped with a hemostat and the operation continued without any inconvenience. Upon removal of the hemostat the bleeding did not continue.

The mass was not touched as it was thought that it would be indiscreet to attempt its removal. If this varix had not been diagnosed and the patient subjected to a kitchen operation and an attempt to remove it as a portion of tonsil been made it is interesting to speculate as to just what would have occurred.

The patient made a complete recovery and the mass which is about the size of a filbert does not bother him at all.

67 Hanson Place.

CHRONIC AURAL DISCHARGE.*

DR. JAMES G. CALLISON, New York.

May 14, 1920, as the result of more than two years of study, the author[1] read a paper before the New York Academy of Medicine on the "Treatment of Chronic Purulent Otitis Media." In that paper attention was called to the anatomy of normal ears and the pathological changes present in those with a chronic discharge. Certain principles were then laid down as to what constitutes an anatomical cure and the required pharmacological properties of the drugs to be used in the treatment of chronically discharging ears. These principles are so important that they cannot receive too much emphasis, and for that reason some repetition from that paper seems to be justified.

Anatomy of Normal Ears: The anatomy of the middle ear is related to the subject of chronic aural discharge only in so far as that discussion deals with the lining of the middle ear cavity, as that lining must be materially altered to effect a cure in a case of chronic purulent otitis media, as will be pointed out later. While there is not complete agreement among the text books of anatomy and otology on the subject, the description of the mucous membrane lining the middle ear cavity as given in Quain's Anatomy may be taken as fairly complete and accurate. It says:[2] "The mucous membrane which lines the cartilaginous part of the Eustachian tube resembles much the mucous membrane of the pharynx, with which it is immediately continuous; it is thick and vascular, is covered with ciliated epithelium, and is covered with many simple mucous glands which pour out a thick secretion; in the osseous part of the tube, however, the membrane becomes gradually thinner. In the tympanum and mastoid cells the mucous membrane is paler, thinner, and less vascular, and secretes a small amount of less viscid, yellowish fluid. According to most observers, no glands are normally met with in the tympanum, but Krause has described and figured simple glands in parts, and Troeltsch describes an ascinous gland on the lateral wall anteriorly. * * * The epithelium of the tym-

*Candidate's Thesis, American Laryngological, Rhinological and Otological Society, Incorporated.

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Accepted for publication, Sept. 12, 1923.

panic cavity is in part columnar and ciliated, with small cells between the bases of the ciliated cells, but the promontory, the ossicula, and the membrane are covered with a simple layer of flattened, non-ciliated cells (Kolliker); and a similar non-ciliated epithelium lines the tympanic antrum and cells."

While the anatomical descriptions of the mucous membrane lining the middle ear do not agree among themselves, they seem to agree on two points. The epithelium lining the cavity of the middle ear is not of the squamous variety, but is of some form of columnar or low cuboidal epithelium; and also that there are some glands of a simple type, which they all agree in calling mucous glands. The character of the discharge in some cases of chronic purulent otitis media, as will be pointed out later, very strongly confirms the presence of mucous glands in the middle ear. Further on, in discussing the anatomic cure of chronic purulent otitis media, I shall show how it is necessary to destroy these glands and alter the type of epithelium in order to secure the desired result.

Pathology of Chronic Discharging Ears: Observations on the pathology of the mastoid bone, as revealed while performing the radical mastoid operation, has shown a bone in most cases completely eburnated, with an entire absence of cellular structure. The antrum is small and filled with granulations, while the attic is normal in size in all dimensions and is also filled with granulations, these being so densely packed that there is no adequate drainage into the external auditory canal. The membrana tympani shows all stages of involvement from a pin point perforation to complete destruction, the most common type showing only a remnant along the handle of the malleus and the tympanic ring. Between the annulus tympanicus and the promontory of the middle ear there is an expansion of the external auditory canal, and this space is also filled with granulations. Granulation tissue also extends into the Eustachian tube, and if a successful radical mastoid operation is performed the cavity is continuously reinfected from the tube, unless the operator is successful in obliterating this canal, which is not always easy of performance. One of the astonishing things in performing a radical mastoid operation is the amount of granulation tissue removed from the narrow space around the promontory and extending into the attic. Clinical experience also demonstrates that there is a wide extension of mucous glands in the chronically

discharging ear, these glands being in some cases freely distributed in the attic and antrum, and constituting one of the obstacles to a cure.

Anatomical Cure Defined: A sharp distinction must be drawn between a clinical and an anatomical cure. A clinical cure simply stops the discharge and causes the condition to become latent, subject to reinfection with each succeeding pharyngitis. On the other hand, an anatomical cure cannot be said to have been effected until there is a complete dermatization of the promontory and all exposed areas, extending up from the otitic opening of the Eustachian tube, or a complete restoration of the drum membrane. To effect either of these conditions a complete eradication of the granulation tissue is necessary. Where the restoration of the tympanic membrane is possible, this, together with a healthy renewal of the epithelial lining of the middle ear will be sufficient. Where the destruction of the drum membrane is so extensive that its integrity cannot be restored there must be a destruction of the columnar and cuboidal epithelium lining the tympanic cavity, together with all the mucous and serous glands present, with a simultaneous extension of the squamous epithelium from the external auditory canal over the exposed areas. That is, the space that forms the remnant of the middle ear must be left in such a condition that there is no possibility of the secretion or collection of fluid. The resultant scar must remain absolutely dry. This is the ideal sought in performing a radical mastoid operation. At the same time the bacterial flora present in the middle ear and attic must be eliminated or reduced to a minimum, as epitheliazation occurs most rapidly on sterile or near sterile surfaces. It is also desirable but not absolutely necessary that the otitic end of the Eustachian tube be healed off by cicatrization and adhesions, so as to completely separate the pharynx from the middle ear space. This is what has happened in the occasionally seen otitis media purulenta residual. A less complete eradication of the pathological process than here described cannot be claimed as an anatomical cure.

Pharmacological Limitations of Drugs to be Used: Consideration of the drugs available for the treatment of chronic discharging ears involves a discussion of two classes of drugs, or drugs to be used for two distinct purposes. These are, first those used for the destruction of granulation tissue, and, second, those available for controlling the infection and assisting in the elim-

ination of the bacterial flora; that is, the drugs to be used by the otologist in his office treatments, and those placed in the hands of the patient as "ear drops". In the paper above referred to, I said that for the destruction of the granulation tissue a saturated solution of nitrate of silver is without a rival, and gave the following reasons therefor: "It is efficient in destroying the granulating material with which it comes in contact, but does not penetrate deeply enough to carry any possible danger to the delicate structures of the internal ear." As to the efficiency of a saturated solution of nitrate of silver the above opinion still prevails. However, in addition to nitrate of silver I have recently been using, with great caution, a 95 per cent solution of trichloracetic acid. These may be used as substitutes for each other in selected cases, as the judgment of the otologist may indicate. It must be remembered that applications of either of these drugs are very painful, so much so that it is advisable to forewarn the patient, and even then some patients will not undergo the pain necessary for securing a cure. The trichloracetic acid is the more destructive of the two agents, and also is the more immediately painful. The pain ceases more quickly, however, than is the case with a saturated solution of nitrate of silver. Nitrate of silver can be used in much larger quantities than the trichloracetic acid, as the latter must be applied with a bare applicator. For this reason it is not possible to use this latter reagent where it is desired to reach granulations far removed from the point of application, as high in the attic. It must be noted in passing that the fused silver bead will not take the place of the saturated solution of nitrate of silver in this work. The bead of silver is efficient only where it can be brought into direct contact with the tissue to be treated. Where it becomes necessary to reach spaces not accessible to direct applicatio a solution must be used, so that it will spread laterally, by a sort of capillary attraction, to parts not directly reached by the application.

For the continued antisepsis of the middle ear, that is, for the "ear drops" to be placed in the hands of the patient, these must contain drugs that are antiseptic and at the same time penetrating and diffusible—drugs that will not coagulate albumin. That is, these drugs must possess the maximum ability to penetrate into the granulation tissue present and diffuse through any fluid that may have collected in the middle ear. At the same

time they must be so highly antiseptic that they will kill the bacteria with which they come into contact, in high dilutions. If the albumins with which they come into contact are coagulated this will interfere with their penetrating power. A consideration of the pharmacology of the drugs involved in the former discussion seemed to leave only four worthy of consideration, and to this time no others have been added to the list. The four drugs worthy of trial in the treatment of chronic purulent otitis media, according to the above standard, are two old drugs—phenol and tincture of iodine—and two new ones—mercurochrome-220 and acriflavine. These drugs penetrate deeply into the tissues with which they come into contact, are highly antiseptic and do not coagulate albumin. Phenol and tincture of iodine are too well known to require any discussion. Acriflavine is diaminomethylacridine chloride, acridine being one of the coal tar basic dyes, and said to be penetrating and highly antiseptic in its properties. Because of these qualities it is being used in the treatment of acute gonorrhea and in infection of the bladder and pelvis of the kidney with some success. Mercurochrome-220 is obtained by substituting an atom of mercury in the molecule of dibromfluorescein, the latter being one of the eosin group of coal tar dyes. It is asserted by the Brady Urological Institute of the John Hopkins Medical School[3], where it was developed, that it has the penetrability of the dibromfluorescein and the antiseptic qualities of the mercury. Both mercurochrome-220 and acriflavine are highly objectionable because of their intense staining properties, the former being a vivid pink and the latter a bright yellow.

These drugs must all be used in a vehicle of fairly high alcoholic content. The presence of water in the middle ear tends to stimulate the formation of granulations. Further, because of its chemical homogeniety with the tissues, water fails to penetrate and thus carry the antiseptic drugs into the granulations. Experience in the pathological laboratory proves that alcohol attains its maximum of penetration of tissues and its minimum of power to coagulate albumin at about 50 per cent concentration. It also attains its greatest efficiency as an antiseptic agent at a little greater concentration—about 65 per cent. A concentration of 50 per cent is sufficient to avoid the stimulating effect of the water on the formation of granulations, and therefore seems to be the proper strength in which to use it as a vehicle for "ear drops". This dilution is less painful than higher concentrations.

Classification of Cases of Aural Discharge: Before undertaking a discussion of the treatment of chronic discharging ears it seems desirable to form some classification which will become the basis of the discussion of treatment. For this purpose these cases may be divided into two classes. First, those cases with a heavy mucoid discharge. Second, those with a frankly purulent discharge. This from the standpoint of the technique of treatment,

Treatment of Class I Cases: These constitute a small but important group of the cases met with in practice. The mucous discharge is so thick and tenacious that it interferes with the penetration of any drug into the affected parts of the middle ear, acting as an efficient plug. This discharge is so viscid and adherent in some cases that it is difficult even to wipe it away with a cotton tipped applicator. These cases are made more difficult because of the fact that the perforation in the drum membrane is frequently small and the hearing fair, making the fight for a cure a difficult one and the reward for a successful outcome an ear that is functionally good. So far I have found no method of removing this viscid mucous equal to the use of the suction apparatus. It does not require a high vacuum to secure the best results, but a number of repetitions, and I am accustomed to break the vacuum after one-half to one minute. These short vacuums, frequently repeated, are more effective and less painful than a fewer number of longer applications. This use of the suction apparatus is not especially painful, and patients do not object to it. I have a patient three years old who says that the treatments hurt him, but he can be induced to forget the complaint by attracting his attention to something else, say the movement of the machinery of the suction apparatus. These applications of suction should be continued as long as any mucopus can be drawn out of the ear, and they should be frequently repeated—two or three times a week. If it is necessary to irrigate these ears, sodium bicarbonate combined with sodium chloride is the best solution to use for this purpose. But the main reliance must be placed in the use of the suction apparatus. Otherwise the treatment is the same as in class II cases, to be immediately described.

Treatment of Class II Cases: This class embraces the great bulk of chronic discharging ears. The discharge is frankly purulent and may be very slight in amount, so slight that the patients are unaware that there is a discharge; or it may be profuse.

The usual clinical cures simply recede to this condition in a latent stage. The drum membrane is usually largely destroyed and the hearing frequently presents a high degree of impairment. When these patients are seen the discharge is cleared away with a cotton-tipped applicator and the fundus rendered as dry as possible. Now, under direct vision, silver nitrate is applied to the exposed parts of the fundus—over the promontory and under the edges of the drum remnant. This may be quite painful, and I am accustomed to begin with a 25 per cent solution and build this up to a saturated solution as rapidly as possible. This solution must be used freely, in order that it may spread under any remnants of the drum membrane, into the opening of the Eustachian tube and as far into the attic as it may be induced to go. The object here is to destroy granulations that have been present for a long time, and no half way measures will suffice. In properly selected cases trichloracetic acid may be substituted for the silver nitrate, as it is more destructive. It is more painful on immediate application, but the pain does not last so long. This same routine office treatment applies to Class I cases after the mucoid discharge has been thoroughly removed by the use of the suction apparatus.

For "ear drops" to give the patient, in the discussion above referred to, I proposed the following prescription, combining the use of phenol and tincture of iodine:

Phenol (95 per cent)	gtt. xv.
Tincture iodin	gtt. xv.
Alcohol	℥ iv.
Water, qs. ad.	℥ j.

This still maintains first choice as a prescription for the patient. If a free discharge of pus is present the patient is instructed to irrigate the ear once or twice a day with boric acid solution, as the condition may indicate. After irrigation the patient very carefully dries the ear with cotton wound on a toothpick and about five drops of the above prescription are placed in the ear and allowed to remain there for five minutes. As the purulent discharge decreases in amount the irrigations are discontinued as soon as may be. Otherwise the treatment is continued long after the ear seems to be dry, in order to be sure that there are no latent foci remaining.

Mercurochrome-220: In some cases there seems to be an idiosyncrasy to some drug in this combination—probably the phenol—

and a watery edema ensues which makes the patient's tinnitus worse without a compensating improvement in the purulent condition present. In other cases this combination seems to be unduly irritating. With other patients psychic reasons may make it desirable to use "something different". When the production of mercurochrome-220 was announced, the description of its pharmacological properties seemed to indicate that it would be a desirable addition to the armamentarium of the otologist. This preparation was intended to be dissolved in water, however, and I was assured through correspondence with the Brady Urological Institute[4] that it could not be held in alcoholic solution. Some experimental work, however, soon demonstrated that once it was dissolved in water, the addition of glycerin would prevent precipitation when diluted with alcohol. In selected cases I give patients a one-half per cent solution of mercurochrome-220, prepared as follows:

Mercurochrome-220	1 gm.
Water	70 cc.
Glycerin	30 cc.
Alcohol	100 cc.

Dissolve the mercurochrome-220 in the water, then add the glycerin and then the alcohol. This makes a solution that is even more permanent than a watery solution and at the same time meets all the requirements for use in running ears. These drops are used exactly as are the above drops of phenol and iodine, and in fact are a good substitute for them. However, unless improvement is prompt and continuous persistence in the use of mercurochrome-220 is not justified. The objection to their use lies in the intense stain they produce in the skin and linen. The instruction for the removal of this stain, as given out by the manufacturers, is rather complicated and liable to irritate a delicate skin. I have found, however, that dilute acetic acid—common vinegar, if you will—is a very efficient agent in the removal of these stains, and this renders the use of mercurochrome-220 much less objectionable. This drug must not be used in watery solution in chronic running ears, as it is precipitated out of solution and forms solid plugs in the fundus of the canal. I have seen such plugs formed after others had used mercurochrome-220 in watery solution.

Neutral Acriflavine: Acriflavine is directly soluble in 50 per cent alcohol, or it may be dissolved in water and later diluted with

alcohol to the desired strength. It produces an intense yellow stain of the skin that is objectionable. This may, however, be removed by the use of household ammonia, as the acriflavine is constructed on an acid base. Up to the present time it has not been tried on a sufficient number of cases to form a final judgment as to its value. It is also possible that it was used in too strong a solution. This was a strength of 1 to 500. In some of the patients the results were most satisfactory, the ears progressing rapidly to a cure. However, this drug is very irritant to the skin in the strength used, and there was a strong tendency to the formation of persistent eczematous conditions. It is probable that higher dilutions, as 1 to 1,000 or even 1 to 2,000, would overcome this difficulty. Further trials will be made and the results presented in a later report. For the present, acriflavine should be used with great caution.

Prognosis: The percentage of absolute cures that will be secured cannot be determined statistically from the small series of cases that I have been able to treat in private practice, and clinic patients are too unreliable for statistical study. I am of the opinion, however, that with patience and persistence on the part of both patient and physician well above 75 per cent of absolute cures can be effected. Among the conditions that render a cure impossible is the presence of a cholesteatoma. Even if a temporary stoppage of the discharge is obtained, it will certainly recur later. Tuberculosis of the temporal bone expressing itself as a chronic purulent infection of the middle ear, would, of course, not yield to this form of treatment more than to any other form. The difficulty here is to make a diagnosis of a tuberculous process. Another condition precluding the possibility of an attempt to secure a cure is the presence of an acute exacerbation of the purulent discharge of such a nature as to immediately endanger the life of the patient. Outside of these I have not so far been able to form any judgment of the type of cases that are not likely to respond to treatment. Surely the usual signs of bone involvement, as enumerated in the text books of otology, do not render the hope of a cure impossible. Among the conditions that render a cure difficult comes first the thick, tenacious muco-purulent discharge described above. A small perforation in the drum membrane forms a severe handicap to treatment, and if the drum membrane around this small perforation is adherent to the promontory, the treatment becomes especially difficult. It has seemed to me that in such cases an

operation for the removal of a part of the drum remnant would be justifiable, although I have not attempted such a procedure.

The time required to effect a cure by this method of treatment has varied from a few weeks to many months, depending on the condition of the ear and the faithfulness with which the patients carried out the treatment. It will not, however, in my opinion, average as many visits on the part of the patient as will be required for the post-operative treatment of a radical mastoid operation, and there will be a much larger percentage of absolute cures. Once a cure has been affected these ears are, in my opinion, much more subject to infection than ears that have never been affected. But they may be expected to respond to treatment on reinfection the same as in the case of the original infection, and a second cure may be surely anticipated.

Results From the Standpoint of the Hearing: These patients may be assured with the utmost confidence that their hearing will be improved as the treatment progresses. There are two factors that enter into the improvement in the hearing. First, the removal of the mass of granulations present in these ears makes it possible for the sound waves to be more completely transmitted to the perceptive mechanism. This in itself will result in a considerable improvement in the patient's hearing. Second, there is in all these patients a large admixture of that condition commonly described as chronic catarrhal otitis media—a condition which from a pathological standpoint I cannot admit to exist, and which I have attributed in another paper[5] to a disturbance of the glands of internal secretion. As one evidence of the frequent union of these two conditions may be cited the frequency with which patients having a chronic discharge in one ear have a more or less advanced progressive deafness in the other ear. Measures directed to the relief of the deafness in these ears in addition to treating the discharge yield the most happy results. Together with the administration of the proper endocrine substances, the following measures have been found effective in improving the hearing: Abscessed and ulcerating teeth, as revealed by the X-ray, must be removed. No other step is so important in this connection, the patients often experiencing an immediate improvement in the hearing. In the second place, diseased tonsils must be removed to prevent the absorption of toxins from their substance. This is of only slightly less importance than the attention to the teeth. At the same time any other foci of infection that may be discovered must be eradicated.

such as possible purulent infection of the nasal sinuses, or of the prostate in men. In some cases the administration of potassium iodid seems to be advantageous, even in the absence of a luetic taint. Where it has been possible to secure a complete restitution of the drum membrane, inflation seems to find its special field of usefulness, for it is quite easy to believe that adhesions must have been formed during the long continued suppuration, and that inflation will help to break them up. These patients, if anemic and run down, may well also undego a course of treatment with the metallic tonics, such as iron and arsenic. They should also receive treatment for the constipation which is so frequently present.

CONCLUSIONS.

1. Chronic aural discharge is in most cases a curable condition. Silver nitrate and trichloracetic acid are available for the destruction of the granulations; and phenol, tincture of iodine, mercurochrome-220 and acriflavine for the continued antisepsis of the ear.

2. The performance of the radical mastoid operation is not justified until a prolonged effort has been made to cure the discharge, except in the presence of a cholesteatoma or an acute exacerbation that immediately endangers the life of the patient.

3. The hearing can be much improved in these patients after the discharge has been cured by appropriate medication.

4. The utmost patience and persistence is justified in the treatment of aural discharge, the reward therefore being a cured ear with improved hearing in patients who are progressively becoming worse, and many of whom later will not be able to earn a livelihood.

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223-225 East Seventeenth Street.

BRONCHOSCOPIC OBSERVATIONS ON THE COUGH REFLEX IN TONSILLECTOMY UNDER GENERAL ANESTHESIA.

Dr. Mervin C. Myerson, Brooklyn, N. Y.

Perhaps the most discussed and least understood factor in tonsillectomy under general anesthesia, is the cough reflex. Physiology text books give practically no space to the subject of cough, even though it is recognized that cough has a physiologic basis, in fact medical literature in general affords very little information on this subject. James Mackenzie[1] defines cough in the following terms: "Coughing is essentially a reflex phenomenon, the center for which is one of the numerous areas associated with the main respiratory one in the bulb. The stimulus is conveyed from the periphery by some branch of the vagus. The result of the stimulus is to cause first a deep inspiration which is followed by a closure of the glottis, then by a sudden and powerful contraction of the muscles of expiration which forces the air through the resisting glottis. By this process, the air drawn into the lungs by the preliminary inspiration is driven out with such force that all movable matter in the large tube is swept out." Lilienthal[2] does not agree with the latter part of this explanation of cough. He says, "The air is not forced through the closed glottis. The glottis opens suddenly at the peak of the intrathoracic pressure of air, and it is this sudden opening which produces the actual cough. We should otherwise have not a sharp coughing sound, but some form of phonation". It appears to the writer that in the production of cough, the glottis is never entirely closed, but that it is different degrees of opening of the glottis that influence the sound and pitch of the cough.

It is generally accepted that a light anesthesia and the presence of the laryngeal reflex during tonsillectomy insures a cough; however, during a recent bronchoscopic study of tonsillectomy under general anesthesia,[3] the writer's attention was attracted by the frequent absence of cough in the cases which were lightly anesthetized. A study of the cough was therefore undertaken in a series of one hundred tonsillectomies in which the laryngeal reflex was present during the operation. The purpose of this study was to ascertain the frequency of cough and the factors which influence its produc-

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Accepted for publication, June 29, 1923.

tion where the laryngeal reflex is present. The presence of cough before operation (during the induction of anesthesia), and during the operation, was noted. In each case, immediately after operation, when the pharynx was dry and free from blood, a direct laryngoscopy and bronchoscopy were performed. The content of the tracheo-bronchial tree was then noted in its relation to the presence of cough. Ether anesthesia was administered by the open cone method. The Arrowsmith Sluder instrument was used throughout the series. The average age of the patient was seven and one-half years.

Tonsillectomy furnishes a pharyngeal content which consists of a mixture of blood, mucus, and saliva, and occasionally some crypt content. Blood is the greatest part of this mixture. The mucus and saliva make up a very small part of this combination, while the crypt content from the standpoint of quantitative value, is negligible.

It is a well accepted fact that a wide awake indivdual will cough when a foreign body comes in contact with the mucous membrane of the larynx, trachea, or bronchus. From this, one would naturally conclude that, in the presence of the laryngeal reflex, a mixture of blood, mucus, and saliva, which might come in contact with the larynx, the trachea, or bronchus, would similarly set in motion the cough reflex. It is this belief that has caused the laryngeal reflex to be so frequently mentioned as the watch dog of the lungs. With this in mind, let us analyze the chart kept for these one hundred cases.

Twenty-two patients coughed during operation. Of these, twenty coughed during the induction of anesthesia. A majority of those who coughed during operation also coughed after operation. Of the twenty-two who coughed during operation, eighteen, or 81.8 per cent had a clean bronchial tree immediately following operation.

Seventy-eight patients did not cough during the induction of anesthesia or during the operation. Six of these, or 7.7 per cent, were found to have a tracheo-bronchial tree clean and free from blood.

Seventy-two patients who did not cough, had blood in varying quantity in the tracheo-bronchial tree.

Twenty-four patients had a tracheo-bronchial tree clean and free from blood. Of the twenty-four, eighteen coughed and six did not.

The observations in this series of cases have shown that the presence of the laryngeal reflex by no means produces a cough when the

tonsillectomy blood mixture comes in contact with the larynx, trachea, or bronchus.

A definite explanation was found in each case in the patients who coughed. Those who coughed did so because of one of three reasons: either because of excessive concentration of ether, or a pre-existing catarrhal condition of the tracheo-bronchial tree, or because of contact of an instrument with the larynx.

When the patient came to the operating table with a pharynx full of frothy mucus caused by the forced administration and excessive concentration of the ether, that patient invariably coughed when the blood mixture came in contact with the laryngo-tracheo-bronchial tract, whereas the patient with a fairly clean pharynx was not so easily stimulated to cough. It was concluded that an abnormal irritability or sensitiveness was produced by the ether, and that this caused the cough.

Patients in whom a mild catarrhal bronchitis exists which cannot be recognized before operation, will cough. The existence of such a type of slight inflammatory reaction is evidenced by the thick mucus secretion which these patients cough up when the tonsillectomy fluid comes in contact with the elements of the respiratory tract. Any mild congestion, no doubt, lowers the threshold of irritability of the tract so that anything that may come in contact with it will produce cough.

When an instrument, such as a tongue depressor or suction tube, comes in contact with the larynx, the cough reflex may be set in motion. This was observed in two cases.

From the above it would seem that cough in tonsillectomy under general anesthesia is not a normal phenomenon, but is dependent upon either an increased irritability of the laryngo-tracheo-bronchial mucosa, or an increase in the intensity of the stimulus which excites the cough reflex. When cough is present in tonsillectomy under general anesthesia, the tracheo-bronchial tree is usually found clean and free from blood. Of twenty-two patients who coughed during operation, the tracheo-bronchial tree was found clean in eighteen at subsequent bronchoscopy. The remaining four coughed after operation, in the ward, when they probably emptied their air passages; although this post-operative cough cannot be reckoned inasmuch as the introduction of a bronchoscope may irritate sufficiently to cause some cough. Nevertheless, it is fair to assume that patients who cough during operation will likely cough after operation, because of the increase in the sensitiveness of the respiratory tract.

During this study the writer was particularly impressed by the occasional absence of cough in some of these lightly anesthetized cases, while the bronchoscope was in contact with the larynx, trachea, or bronchus. There would seem to be a difference in the threshold of irritability of different individuals. To substantiate this, the writer has recently stimulated the interarytenoid region and carina, which are the points of greatest irritability in the mucous membrane of the tract, by contact with a probe, in a number of lightly anesthetized patients. It was found that about one in ten do not cough when so stimulated.

The absence of cough in the presence of light anesthesia and the laryngeal reflex can best be explained by a consideration of the action of the pharyngeal content on the mucous membrane of the respiratory tract. Blood and saliva, when admixed with the normal secretion of mucus, forms a combination which evidently does not irritate or stimulate sufficiently to bring forth cough. The explanation is readily found in the fact that the pharyngeal content which comes in contact with the laryngo-tracheo-bronchial tree is so constituted as to be non-irritating. Blood, which is the bulk of the mixture, is an autogenous fluid which is in most intimate contact with all the body structures. Therefore it should not be expected to irritate any of the body surfaces with which it comes in contact, unless, perchance, the blood is mixed with products of inflammation, or it comes in contact with an unusually susceptible mucous membrane. At least, it has been noticed that blood and its associates, mucus and saliva, do not produce a cough when in contact with the membranes of the larynx, trachea, or bronchi. This is further borne out by the fact that in hemoptysis the patient relates his experience to the effect that he suddenly felt some blood in his mouth, or a mouthful of blood, and later coughed when the blood had remained in his respiratory tract long enough to coagulate and call forth a cough for expulsion. Every internist, and those who study cases of lung abscess and pulmonary tuberculosis, are not infrequently struck by the absence of cough in these patients, even though they have profuse expectoration of pulmonary exudate. It is very probable that the mucosa learns to tolerate the constant secretion in the same way that the bronchoscope or foreign body are tolerated, without cough, as was clearly brought out by Jackson[4] in a recent publication.

In the absence of cough, what is the mechanism of expulsion? Bullowa[5] and Gottlieb[6] have demonstrated in their work on anesthetized dogs, that the expulsion of tracheo-bronchial content in the

presence of a deep anesthesia and a suppressed cough reflex, is dependent upon the cilia and what they describe as a peristaltic muscular wave. Bronchoscopically, the writer has not been able to localize this peristaltic action. The writer is of the opinion that the main factor in the expulsion of content in the absence of cough is the ciliary action. From bronchoscopic observations it would seem that suppression of the ciliary action would require anesthesia of such depth as to make it lethal.

In tonsillectomy under general anesthesia, the larynx does not seem to be the infallible guardian of the lungs which it is said to be. It does, however, attempt to guard the entrance to the respiratory tract in lightly anesthetized patients, in the following manner: There is a tightening of the structures of the floor of the mouth, the larynx is elevated, and the glottis closes. One can see these last two phenomena clearly when standing at the head of the table while the tongue depressor is in place. Following the closure of the glottis, one can see an ejection, as it were, of the blood as it comes in contact with the vocal cords. Whether this phenomenon is a part of the act of swallowing, or whether it occurs entirely independent of it, has been difficult to ascertain. It appears that the laryngeal action occurs independently in some cases, while in others it is combined with the act of swallowing. Although it is true that the closure of the glottis prevents the entrance of blood into the trachea, it is also true that relaxation of the glottis permits the blood to enter. It seems that this laryngeal action occurs independently when a sufficient volume of blood strikes the larynx so as to stimulate it.

If blood was found in the tracheo-bronchial tree of seventy-two patients who had their laryngeal reflex intact and did not cough, it follows that cough is not the normal mechanism of expulsion in tonsillectomy under general anesthesia. In a previous study it was ascertained that the tracheo-bronchial tree empties itself of its abnormal contents in from twelve to fifteen minutes. Such being the case, the ciliary action and the compressibility of the peripheral lung tissue must be the main factors in the expulsion of blood. The true causation of lung abscess in cases of aspiration, is the inability of any portion of the lung to empty itself of its aspirated secretion and blood. This phase of the subject will be dealt with in a future communication.

CONCLUSIONS.

(1) Seventy-six of one hundred patients in whom the laryngeal reflex was present, had blood in varying quantity in the tracheo-bronchial tree.

(2) Of the twenty-four patients whose tracheo-bronchial tree was clean, eighteen coughed during operation.

(3) The laryngeal reflex does not insure the presence of cough when the pharyngeal content comes in contact with the larynx, trachea, or bronchus.

(4) Only in the presence of increased irritability of the respiratory tract, does the patient cough when lightly anesthetized.

(5) Blood, mixed with mucus and saliva, forms a mixture which does not carry a sufficient stimulus to set the cough reflex in motion.

(6) Cough is not the normal mechanism of expulsion in tonsillectomy under light anesthesia.

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184 Clinton Street.

Editor THE LARYNGOSCOPE:

The undersigned would appreciate it if authors of papers concerning the ear, nose and throat would kindly place on their mailing list Dr. Max Goerke, Primaerarzt am Allerheiligenhospital in Breslau, Germany. Dr. Goerke is one of the editors of the Folia Oto-laryngologica. Abstracts appear in the Internationales Zentralblatt fuer Ohrenheilkunde und Rhino-Laryngologie, which is part of the Folia Oto-Laryngologica.

Very truly yours,

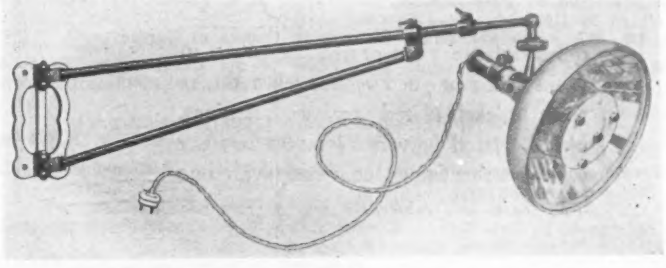
EMIL AMBERG.

Detroit, Michigan.

THE SCIALYTIC LIGHT.

DR. SAMUEL MCCULLAGH, New York City.

This shadowless operating light is of French manufacture and was on display at the last International Congress of Laryngology, which was held in Paris in July, 1922, where I ordered the one I am showing. It is made in two sizes, one for general operative work, and this size which is called the oto-laryngological model. As you see, it consists of an inverted metal saucer in the center of which is fitted a dioptric lens. Direct rays are shut off by the metal plates directly under the lamp and lens. Around the rim mirrors are set which cause an inverted cone of light to be thrown on the operative field. Obstructing a portion of these rays with the head or hand does not seriously interfere with the illumination of



the field. Naturally, if the obstruction is at the apex of the cone the field will be obscured.

The lamp is a 12 c. p., one designed for low voltage. As you see there is a rheostat used. This is temporary and I am waiting proper 110 V. lamps. The apparatus is mounted upon a stand which allows adjustment of the height. The proper focus is obtained by adjustment of the position of the light by a set screw.

The illumination is excellent, even in the depths of a cavity; the light being white and resembling sunlight. It dispenses with the necessity of a headlight, head mirror or an assistant to direct a hand light, and is much cooler than the ordinary battery of lights above the operating table.

17 East 38th Street.

*Accepted for publication in "The Laryngoscope", April 28, 1923.

AMERICAN BRONCHOSCOPIC SOCIETY.

The sixth annual meeting of the American Bronchoscopic Society was held at the Ambassador Hotel, Atlantic City, Wednesday, May 9, 1923. The president, Dr. S. Iglauer, in the chair.

The following program was carried out:

Morning session, 9:00 a. m.

The Relation of Bronchoscopy and Esophagoscopy to Surgery and Medicine. Dr. Iglauer.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

(Drs. Arrowsmith and Carmody were appointed as an Auditing Committee to examine and report upon the books of the treasurer.)

Presentation of Specimens and Instruments.

Dr. Chevalier Jackson, of Philadelphia, showed a specially constructed forceps for gripping globular objects.

Carcinoma of the Bronchus, Dr. H. B. Orton, Newark, N. J.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Case of Carcinoma of the Left Primary Bronchus, Dr. D. Crosby Greene, Boston.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Jackson, Imperatori, J. S. Fraser (by invitation), closed by Drs. Orton and Greene.

Dr. Mosher showed slides illustrating Causes of Cardiospasm.

Retrograde Oesophagoscopy for Cancer of the Oesophagus. Bronchoscopy, the Life Saver in Two Unusual Cases, Dr. Fielding O. Lewis, Philadelphia.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Jackson, Mosher, Imperatori; closed by Dr. Lewis.

Treatment of Carcinoma of the Esophagus with Radium, Dr. T. E. Carmody, Denver.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Greene, Mosher, Lewis, J. S. Fraser (by invitation), Jackson; closed by Dr. Carmody.

Lantern Slide Demonstration of Bronchoscopic and Esophagoscopic Cases, Dr. Chevalier Jackson, Philadelphia.

Discussed by Drs. Mosher, Orton, Chamberlin; closed by Dr. Jackson.

The Society then went into executive session.

The minutes of the previous meeting were read and approved.

Reports of Officers:

The resignation of Drs. Richard Jordan and C. W. Richardson were presented. These were accepted, on motion duly seconded.

The secretary mentioned that several delinquents in dues had been notified of their delinquency.

Applications for membership. Several applicants, duly proposed and seconded, had not been received as members, as they had not filled the requirements, i. e., reported 25 cases, and sent a reprint of work on esophagoscopy or bronchoscopy.

The report of the secretary-treasurer was made informally.

More prompt co-operation in the preparation of the program was asked for, for the next annual meeting. The treasurer's report showed a balance of $601.12. The sum of $100 had been set aside for a memorial scholarship in memory of Dr. Lynah.

New Business:

The matter of legislation to encompass the proper labeling of lye or caustic potash was discussed from all points. Dr. Jackson gave a resume of his endeavors with resulting legislation for the state of Pennsyl-

vania, and asked co-operation from the members as regards other states. The discussion was carried on by Drs. Iglauer, Dean and Chamberlin.

On motion duly seconded, a committee of five was asked for to confer with the Committee of the A. M. A. to report on this subject at the next annual meeting.

Election of officers. The nominations were made from the floor.

President, Dr. R. C. Lynch; vice president, Dr. F. O. Lewis; secretary-treasurer, Dr. W. B. Chamberlin. Members Executive Committee, Drs. Iglauer and Mosher.

The secretary was ordered to cast one ballot and the nominations were closed. The officers so designated were declared elected.

The incoming president, Dr. Lynch, thanked the Society for the honor conferred upon him, in electing him as president, and expressed his earnest wish to further the interests of the Society.

The meeting then adjourned.

Wednesday, 2:30 p. m. Scientific session:

Report of Eight Endoscopic Cases, Dr. C. J. Imperatori.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Lynch, Carmody, Jervey, Dean.

Traumatic Rupture of Oesophagus During Dilatation. X-ray of Coin in Oesophagus. Color Drawing of Cyst of Epiglottis, Dr. Henry S. Forbes, New York.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Chamberlin, Freudenthal, Greene, Lynch, Taylor, Dean, Mosher; closed by Dr. Forbes.

A Case of Urticaria of the Trachea, Dr. Wolff Freudenthal.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Dr. Lewis; closed by Dr. Fruedenthal.

The Peanut Problem, Dr. J. W. Jervey.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Patterson, Carmody, Moorehead; closed by Dr. Jervey.

Retro-Oesophageal Abscess from Selt Traumatism, Dr. Gordon Berry.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Drs. Greene, Chamberlin, Richards, Weil, J. S. Fraser (by invitation), Dean; closed by Dr. Berry.

The Auditing Committee presented their report, and stated that the books had been examined and found correct.

Systemic Complications in Cases of Foreign Bodies in the Bronchi of Children, Dr. Ellen J. Patterson.

(*To appear in a subsequent issue of* THE LARYNGOSCOPE.)

Discussed by Dr. Lynch.

This closed the scientific session.

Dr. Chamberlin in a brief statement said that arrangements had been made with Dr. Goldstein to publish the records of the meetings in The Laryngoscope, this would include printing of discussion in full.

The meeting was then declared adjourned.

Morning session, Wednesday, May 9th, 9:00 o'clock.

Address of the president.

Presentation of Specimens and Instruments.

Dr. Chevalier Jackson said he had a case of ball bearing in the bronchus and had been delayed by the slipping of forceps off the globular object. He had devised a mechanism to be fixed on the arctic and antartic circle of each pole, this was slipped over the instrument. The mechanism was made to fit over movable objects of different sizes, marbles, etc.

Dr. Jackson also showed a bronchoscope of flat make throughout its whole extent. The instrument could be made in various sizes and to fit the larynx.

Carcinoma of the Bronchus, Dr. H. B. Orton, Newark, N. J.

Carcinoma of the Left Primary Bronchus, Dr. D. Crosby Greene, Boston.

DISCUSSION.

DR. CHEVALIER JACKSON said: These are two extremely interesting cases. What the future of bronchoscopy will be to malignant disease of the lung, no one can predict. We may get some very great surprises. I had one myself, nine years ago. I had a patient, with Dr. Patterson, in Pittsburg, who said he had a ball valve in the lung. This patient was two years in an institution for tuberculosis, but they never could find bacilli in the sputum. He then went to a hospital in Philadelphia, on account of bronchial obstruction. There they diagnosed the case as one of lymph gland pressing upon the bronchus. Dr. Johnson examined the case fluoroscopically and reported that the lower lobe was lit up momentarily, and thought it was a non opaque foreign body, but could not say for certain. Bronchoscopy showed what looked like a fibroma. If it was thought to be malignant, we should not have felt justified in removing it; but it was taken out with biting forceps and found to be an epithelioma. The case was published in the *American Journal of Medical Science*. The patient is alive and well at the present time. It was hoped that the man would be presented at this meeting. His fare was offered, but he wrote back and asked for his wife's fare as well, and that terminated the negotiations.

One point about these cases is the diagnosis by the X-ray. There is apt to be an inflammatory process around the malignant process, so that exact diagnosis cannot be made. I think we shall soon treat lung suppuration by means of the bronchoscope. No doubt we shall encounter many errors in diagnosis. We shall be able to detect and treat these cases much more early. Surgeons hesitate to attack malignancy at the root of the lung. Operations on the mediastinal portion of the bronchi have a mortality of 100 per cent. There are two points to be remembered: one is that we must develop a technic for the internist so that he will not be frightened away by bronchoscopy; another is that we should not do bronchoscopy on moribund subjects, or we shall add to the figures supposed to give the mortality of bronchoscopy. One gets an urgent message from a patient dying of pulmonary abscess. If he is bronchoscoped, and he dies, as he surely must, that is attributed to bronchoscopy. If there is a ghost of a chance we must go ahead, but if the man is dying, it only increases the mortality figures for bronchoscopy.

DR. C. J. IMPERATORI said: We had a patient in Bellevue Hospital with lung abscess; he was being treated by irrigations. After many irrigations in the lower part of the bronchus I saw granulation tissue at the time of the last irrigation. The man had been sent to the country without improvement. He was a man over 45, had had purulent expectoration for a year and was placed in the tuberculosis ward at Bellevue, although not diagnosed positively as tubercular, because no bacilli were found. He had several cavities, with fairly large dilatation of the right bronchus. We thought it was bronchiectasis and considered it a good case for irrigation. He came to the laryngological service. He was bronchoscoped under local anesthesia. At the termination of the right bronchus I saw granulation tissue, a piece of which was removed. The pathologist reported epithelioma, but I was not satisfied that primary epithelioma could occur in the bronchus. The laboratory reported an infiltrating mass of epithelial cells, varying in size and shape, deeply staining and showing mitosis. The diagnosis was adenocarcinoma. Rather than continue irrigations we sent him to the memorial hospital for radium treatment. Massive doses were used several times for two months, but the man lost weight and finally died. Dr. Ewing did the autopsy and made a section from the rear of the bronchi. The specimen was too large to bring down here. Dr. Ewing reported adeno carcinoma. The interesting point is that the area of the growth was on the site of a tubercular abscess. This happens, according to

writers on this subject. It was strange that they never got tubercle bacilli in the sputum. Dr. Ewing said that we never got the particular specimen with the bacilli, although we had 19 sputum examinations on our service, with the antiformin method. No bacilli were shown.

DR. J. S. FRASER (Edingburgh, by invitation) said: I regard it as a great honor to be invited to be present at this meeting. I have simply come here to learn, as I am listening like a child in the matter of bronchoscopy. I am reading a short paper before the Laryngological Society, but my ignorance of bronchoscopy is profound. I have no intention, therefore, to encroach on your valuable time because I have no experience of carcinoma of the bronchi. I am struck by the skill shown by your bronchoscopists. It is also remarkable to find here how well the cases are examined medically before being submitted to examination. We have a great deal to learn from you in regard to this matter of co-operation. Here the co-operation between the specialist and the internist is so complete, whereas, in our country, I am afraid our examinations are very haphazard.

DR. H. B. ORTON (closing) said: When the removal of this growth was done I might be criticised for the manner in which I removed it. It happened so quickly. The growth was one with a small piece, like a ball valve flapping in the wind. Turning the scope round and manipulating it, I caught the growth up. There was very little bleeding, but there was some pus excape through the bronchoscope. The patient had no febrile reaction and left the hospital the next day.

DR. J. CROSBY GREENE (closing) said: I should like to mention that my patient was under the observation of a competent internist 4 months before bronchoscopy was done. If early bronchoscopy were general the outcome would be better. In this case the patient should have been bronchoscoped sooner. One logical treatment for this extensive growth is a local implantation by the seed method, followed by high voltage X-ray treatment. If any radiation will be effective, this combination method will do it. This matter will be reported on again next year.

DR. H. P. MOSHER presented slides illustrating various conditions.

Dr. Mosher said: Dr. Jackson asked me before this meeting if I had any new reason for the production of cardiospasm. Gentlemen, I have!

The expansion of the base of the lung tips of the lower lobe shuts off a piece of the lower end of the esophagus. It looks therefore as if the lower end of the esophagus has a hard time. When the liver is pushed up it is shut off; when the lung tips expand it is shut off; so it gets pretty well banged about. At a recent meeting I spoke on the subject of webs. This slide shows webs of the upper end of the esophagus and pyriform sinus. The case had a typical history of webs, yet the usual X-ray taken of these cases are useless. We don't make the X-ray high enough. If we would take the larynx instead we should get a picture which would give the diagnosis; in other words, we find the collection of barium is in the pyriform sinus.

In one case a man had paralysis of the left half of the face which cleared up but left persistent trouble in swallowing. In looking into the throat the left lateral muscle was motionless, which gave a clue to the diagnosis, confirmed by fluoroscopic plates. The barium was at the base of the epiglottis. The barium trickles down the adherent side. With a double web you will have this kind of shadow in the pyriform sinus. This lateral view gives you a picture of the barium looking like the large comb which we are informed is coming into fashion again.

In another case the picture is of interest, because years before she had a bougie passed with slight relief. She had a double web, which was broken, with relief of symptoms. The knob shows all that was left of the web.

This picture shows the terminal portion of the esophagus. There is cardiospasm. A 30 bougie passed, but would not proceed. I could not understand, but I think the reason is explained. The woman came in

starving, with pernicious vomiting, and went out swallowing normally, but I could not pass the bougie. In this case the lung tips going down strangle the osephagus. When the diaphragm is down there is a long tortuous tunnel and the woman is swallowing through this tunnel, but the antero-posterior diameter must be larger than appears, or she could not live. The bougie would pass the tortuosity of the tunnel.

Another case shown is one of extensive tuberculosis of the lung with chronic deformity of the right half of the diaphragm causing deformity of the liver, which is practically cut in half. Tuberculosis of the lung, deforming the liver is another cause of cardiospasm.

Retrograde Oesophagoscopy for Cancer of the Oesophagus. Bronchoscopy, the Life-saver in Two Unusual Cases, Dr. F. O. Lewis.

DISCUSSION.

DR. CHEVALIER JACKSON said: I would like to express my delight at the splendid work being done. I always feel elated when some one starts to work with carcinoma of the esophagus. Bronchoscopy has progressed a great deal. Our worthy president is slightly reactionary in telling us that some of the foreign bodies in the lungs have to be taken out from the outside, through the ribs. I don't think so. I think if they can go through the mouth, they can come out the same way. At one time we tried to get out a piece of bone by external operation, but at that period, the airplane would not leave the ground. There has been since as much progress in bronchoscopy as there has been in the navigation of the air. When I hear of the wonderful things done in bronchoscopy I always think of carcinoma of the esophagus. 35 years ago with the crude old esophagoscope, I started to study carcinoma of the esophagus. The mortality was then 100 per cent. Gentlemen it is still 100 per cent. These patients all die. It can be held in check, but they finally die of carcinoma or its complications. I feel enthusiastic when attempts are made to do something for these cases. I think Dr. Lewis' retrograde method is a good plan of attack. He has a new way of reaching carcinoma of the esophagus, lower down, near the diaphragm. These cases required gastrostomy which should be done early, and I think radium can be put right in. With the retrograde esophagoscope the site of the disease can be reached. I think with low grade malignancy we shall get remarkable results. I compliment Dr. Lewis on his good work.

With laryngectomy patients, when they begin to go bad on the table, and the patient gets pneumonia, you can put down the bronchoscope to see why the air is not getting down. You can uncork the lung and save the patient's life. In one case of a little child, 17 life saving bronchoscopies were done, removing clots from the bifurcation of the bronchus. This requires plumbing. If the air does not get down you must put in the bronchoscope.

DR. H. P. MOSHER said: I agree with Dr. Jackson about early opening of the stomach in esophageal obstruction, and also that the mortality is a reproach to our work as specialists in the esophagus and bronchi. I can see how Dr. Lewis can get the lower end by retrograde work and the upper end by esophagoscopy, but I can't see how he is so sure of what goes on between!

You can put down a large tube till you get to the tumor and then put a small tube down through the lumen of the large tube. Then you can map out the extent of the carcinoma, if this is possible in spite of bleeding. I think you have a better chance than by looking from the top and the bottom and guessing at what lies between the two ends.

DR. C. J. IMPERATORI said: I would like to ask Dr. Mosher about the patient who had had cerebral hemorrhage and paralysis of one vocal cord.

DR. H. P. MOSHER said: He had considerably more than that. There was paralysis of the anterior pillar and posterior pillar with the lateral muscle. When the patient swallowed the lateral muscle came to the median line on the right, but on the left everything was motionless.

The left cord was not absolutely paralyzed, the upper half of the pharynx and esophagus were paralyzed. He had no paralysis of the soft palate, but fluid came through his nose occasionally.

DR. C. J. IMPERATORI said: That looks like the syndromes of Avellus, which is known to all of us.

DR. MOSHER said: That is known to you but not to me.

DR. C. J. IMPERATORI said: I thought you all knew that. If Dr. Mosher does not know, perhaps some others do not know either. It seems that this case might be that, plus an esophageal web. It possibly had origin in the nucleus ambiguous of the spinal column. Neurologists would have found on the opposite side a paralysis of the soft palate, perhaps also of the larynx and esophagus. There would be absence of heat and pain on the right if the paralysis were on the left side. The lesion is in the nuclei of the tenth nerve. These cases get better, but have recurrent attacks.

DR. H. P. MOSHER said: This case demonstrated filling of the pyriform sinus. There was no web.

DR. IMPERATORI said: That makes it all the better for my suggestion. I saw a case last June. The patient complained of difficulty in swallowing. With any fatigue he had total aphagia. He was fed by rectum. The diagnosis was that of this syndrome. We could not get the soft stomach tube down. The patient refused esophagoscopy. We passed a stiff bougie down and then passed the stomach tube. He was fed through the stomach tube and the nose. Another patient had the same symptoms. He was esophagoscoped. On the side opposite paralysis of the larynx there was spasm of the esophagus. We passed the esophagoscope and the patient began to swallow without regurgitation. On one side there was spasm like pharyngospasm, on the other side blank.

DR. F. O. LEWIS (closing) said: I have never felt justified in forcing the tube between the upper and lower boundaries of the possible malignancy, because the growths are very friable and bleeding is profuse. I think it would be dangerous. We have often passed a capsule of radium into a stricture which is large enough to admit it, but I doubt whether much can be seen in the area between the upper and lower boundaries because of bleeding.

DR. S. IGLAUER said: I think that Dr. Lewis can get a good measurement of the tumor by doing esophagoscopy above and below and then taking X-ray in situ. That would give the dimensions of the tumor.

Treatment of Carcinoma of the Oesophagus With Radium, Dr. T. E. Carmody, Denver.

DISCUSSION.

DR. D. CROSBY GREENE said: As Dr. Jackson has said, there have been no cases of cure by radium. Two years ago I reported 40 cases treated at the Huntington Memorial Hospital. We tried radium seed treatment. As regards danger, there is only one case of perforation from planting the seeds into the tumor. Where the perforation occurred it was doubtful whether perforation occurred from the seed or from the disease itself. Perforation occurred one month after the radium treatment. The results of radium treatment in my hands have been a failure in the long run, but life was prolonged and the patient relieved and made comfortable for a period of time which may have been worth while. One case of complete esophageal obstruction got along comfortably for a year and the growth was held in abeyance. Any new method of treatment of this condition is worth serious consideration on account of the comfort of the patient.

DR. H. P. MOSHER said: Dr. Carmody said syphilis was to be excluded from the diagnosis of carinoma of the esophagus. I have been waiting for years to find syphilis of the esophagus. One man had a four plus Wassermann, and the specimen looked like syphilis, but the pathological report was carcinoma. As to the fluoroscope with use of radium, I have been trying it with modified apparatus without success. Colloidal silenium has been used by the French and the English for relief of pain and

opening of the obstruction. It seems to be another method of giving temporary relief, but it is dangerous and causes fatal collapse in some cases. It is given by intravenous injection.

DR. F. O. LEWIS said: These cases reach us very late. I was wondering if the gastro-enterologist and general practitioner would bring the patient to us earlier, if more could not be done. The first thing to do is gastrostomy, in order to place the esophagus at rest, then, perhaps, the use of Dr. Greene's method of implantation of seeds would give better results. We have had a number of cases at the Philadelphia General Hospital, but all were very late cases.

DR. WM. B. CHAMBERLIN said: It is astonishing how rapidly these cases progress. I had a case referred to me by the general surgeon, and at the time I first saw the case there was an annular carcinoma giving marked constriction. The patient went bad on the table and operation was deferred for a few weeks. Later I esophagoscoped the case and found extensive carcinoma extending to the level of the cricoid, four inches from the site of the previous growth. This had occurred in a few weeks.

DR. J. S. FRASER (by invitation) said: I would like to ask about carcinoma. I don't know whether you mean carcinoma of the upper part of the esophagus, or the lower part of the pharynx. One speaker mentioned 55 per cent of cases as occurring in the middle third. In my experience in Edinburgh the figures are different. We had 5 or 6 in the lower third, 3 in the middle third, and 70 or 80 in the upper third. Dr. Logan Turner records 130 cases behind the larynx and in the upper opening of the esophagus. Many of these cases cannot be diagnosed by the indirect method of laryngoscopy; but when you get a typical history of difficulty in swallowing and have a collection of frothy mucus and saliva in the pyriform sinus, back of the larynx, looking like what we see in the meadows and call "cuckoo spit" you can then expect to find carcinoma in the retropharynx. I wonder if there is a marked difference in the figures of malignancy and disease of the food passages in this country. When 55 per cent is given as the figure, does that include the cases where the hypopharynx is the site of involvement?

DR. CHEVALIER JACKSON said: That is a very interesting point made by Dr. Fraser. I had heard before that in Edinburgh there were many cases of carcinoma of the upper end of the esophagus. There is no question but that carcinoma below the upper orifice is much more frequent in this country. These post cricoidal cases are less frequent here than in other portions of the esophagus.

DR. H. P. MOSHER said: I have a series of cases with growth all at the lower end; then again another set may be all at the upper end. I don't know what they eat in Edingburgh, but in this country we don't have the preponderance at the upper end.

DR. CARMODY (closing) said: These statistics which I quoted are from Guse's 1142 cases, and in that series 55 per cent were of the middle third. I don't know whether that includes the hypopharynx. In the last series the figures were 216, out of 340 carcinomata. I don't know what his statistics cover. He divides cases into the upper, lower and middle thirds. Mills makes 4 divisions, the same as the others, with the addition of an abdominal group. In regard to syphilis of the esophagus, I have seen 3 slides reported as specific disease, but I have never seen the patients. I have asked to see the patients but they don't come. They all cleared up under antisyphilitic treatment. Whether they also had carcinoma in a quiescent stage, I don't know. They may be mixed cases. The point Dr. Lewis makes is true; these patients are unfortunately seen very late. They have had symptoms for years before being seen. Then they may get a blockage and think that is the beginning of the trouble. A woman laid the cause of her complaint to the fact that her physician gave her a pill; the pill stuck and she thought that was the cause of the trouble. In regard to radium, I have used seeds and needles and these are of value at the upper end, but the cases of the hypopharynx cannot take the tube, you must use needles

or seeds, the tube won't remain in place, it will be regurgitated. In regard to the preponderance of upper cases, I have heard Scotchmen drink 2 glasses of whiskey before breakfast. These cases may be due to Scotch whiskey.

DR. CHAMBERLIN said he had heard it asked how much whiskey a Scotchman would drink, and the answer was "any *given* amount".

Lantern Slide Demonstration of Bronchoscopic and Oesophagoscopic Cases, Dr. Chevalier Jackson.

DISCUSSION.

DR. H. P. MOSHER said: Dr. Jackson referred to the eternally recurring question of cardiospasm. As to the name—in England, Dr. McKenzie calls it epicarditis, when there is involvement of the terminal portions of the esophagus. Dr. Jackson is better at long names than anybody, so I have no doubt that his term will be finally accepted. I call it "obstruction of the terminal portion of the esophagus", a phrase so long as to require a rubber stamp. As to the question asked by Dr. Jackson, when one part of the tube is obstructed, is the rest of the tube open; it is not, the rest of the tube cannot be open. You can't tell what goes on in between, unless a large amount of barium gets down. The size of the obstruction will determine the size of the rest of the tube. It seems as if the obstruction must persist. We contantly take fluoroscopic films which show that the middle part of the narrowing is not the actual narrowing. As to water getting down with a rush on one side—I will show this in 2 cases which will be reported later. Dr. Jackson is getting at the facts of my next paper so as to steal my thunder before I read it, but in that paper I shall report that the barium goes down from a nearly full esophagus and stops at a point, then if you give water the esophagus will open and let the fluid down with a rush into the stomach. I have no inborn spite against spasm, but I have not been able to prove spasm. I think it is a twist of the esophagus on its vertical axis and when you give enough fluid there is relaxation of the lung tips and everything goes down.

DR. H. B. ORTON said: Dr. Jackson spoke of foreign bodies in the stomach and asked how long a time should be given them to pass. Last summer I had an accident which disabled me. Just before this the hospital called me up and said they had a man there who had taken block-an-fall whiskey (you walk a block and then fall). They were using the stomach tube on him when he bit a large piece off and swallowed it (about 15 inches). The X-ray showed it in the stomach. I had to go to Morristown at the same time, to remove a teaspoon swallowed by an insane patient and I thought the tube would probably be passed out by the intestine and did not go to the hospital. On August 16th I was doing laryngoscopy with a Klar head light when I received an electric shock that turned me black and disabled me until October. I heard afterwards that an ambitious surgeon opened up the man next day and found that half of the tube had already passed the pylorus.

DR. C. J. IMPERATORI said: A few years ago I had a shock, but not such a terrific one as Dr. Orton mentions. I was passing a Bruening pharyngoscope through a child's pharynx and we all got shocked. I was knocked to the floor.

DR. W. B. CHAMBERLIN said: I might add that I was trying out the Holmes pharyngoscope with a street current and the whole end was fused off. I hate to think what would have happened if this had been in the patient's naso-pharynx.

DR. F. O. LEWIS said: These scopes should be attached to a battery and not to the street current.

DR. H. B. ORTON said: I was doing laryngoscopy with a Klar head light. I always use a battery now.

DR. CHEVALIER JACKSON (closing) said: I thank Dr. Mosher for his illuminating remarks on the subject. I hope we shall find a name of less than four or five words. Epicarditis is misleading, because *epi* signifies upon, and *cardia* may mean the heart or the cardiac end of the

stomach. I wish Dr. Mosher would suggest a word that would save space in medical literature. Everybody follows the use of the term "cardiospasm" with a paragraph of apology. Dr. Orton's experience with the Klar head light reminds me that I used to get tingling in my head from a head light which I used for examination of the larynx and pharynx in the clinic in Philadelphia. It was on the street current. Some of the European endoscopists use a street current with a Klar head light. If there is any contact the endoscopist would get the shock and not the patient, but if the light touched the patient it would convey the effect to both vagi. In regard to the rubber stomach tube, I am sorry Dr. Orton did not do a gastrascopy; but such an object might easily pass through the intestinal canal. Its size would render it easy to remove by gastroscopic methods. External operation was unnecessary.

In regard to pouches: Trousseau said that all cases of pouch died of stricture; that is because there is more or less pouching with all strictures. The surgeon often punctures the pouch by puhing a bougie through it. With the Tucker bougie the string pulls it all the way up and through the devious passages.

In regard to the lye legislation, I am willing to take the suggestion of the Chair and discuss this under New Business at the Executive Session.

EXECUTIVE SESSION.

Discussion regarding Lye Legislation.

DR. CHEVALIER JACKSON said: I appreciate the enormous work attached to this question. I am chairman of the committee of the American Medical Association and I have to make a report to that body as to what is the best thing to do next. Is it best to attempt to gain national legislation, or will it be better to take it up in each state? Personally, I cannot put anything through Congress, because it is beyond my physical and financial powers. Moral suasion has proved to be a failure. If you can demonstrate to the packers that you can save two cents a ton they will listen to you. If some preparations of lye are properly labeled, they are subject to unfair competition from those that are not. The housewife will naturally choose those that have not the poison label. Legisaltion must make it fair to everybody. There should be in each state some one to get evidence for the legislature. There are only 15 states represented at this Society, but I want to embody in this report suggestions from the members to take up at the meeting of the American Medical Association Committee.

DR. CARMODY said: What is the legal status? Will it have to go through state legislation before we can get it through Congress?

DR. JACKSON said: National legislation takes precedence over state legislation. The two can work together if they don't conflict. The federal legislation can only work in regard to interstate commerce. State legislation applies to commerce within the state, and would be better for local products that have a smaller sale.

DR. IGLAUER said: There is a bureau in Washington that issues poison labels. Would it be possible to get the Bureau to take this matter up?

DR. JACKSON said: I had a letter on this subject from Dr. Woodward. This Bureau covers the District of Columbia, but does not have jurisdiction outside of it. One of the officers of the American Medical Association tried moral suasion by writing to all the packers, and only one answered. He said that there was no more need of labeling lye cans, than there was of labeling boxes of window glass, warning people not to cut themselves. At that rate one need not label bottles of cyanid of potassium, or issue warning beyond telling people not to cut themselves opening the bottle!

DR. IGLAUER said: The lye packers have an association and their convention meets in Chicago, to consider methods and trade interests. If we could get them to put this thing through voluntarily, it would save a great deal of legislation. Dr. Jackson thinks these fellows are all

liars, but we might get the American Medical Association to take it up with them.

DR. JACKSON said: I don't want to discourage effort, but I think a flaw in that argument is that while they might make a gentleman's agreement among themselves, it would not be binding, nor would it include any new firm who did not belong to the association and who would be free to label or not as they pleased.

DR. DEAN said: Dr. Jackson has accomplished a very fine piece of work in Pennsylvania. I have begun making research as to how work might best be done in the middle west along these lines. I believe in an approach to the legislative committees of the state medical societies. If a committee from these bodies can meet with the American Medical Association committee, I believe more can be accomplished in each state than by trying national legislation.

DR. CHAMBERLIN said: I believe more can be accomplished by state than by national legislation. In the state of Pennsylvania it is unsafe now to ship caustic alkalis, unlabeled. If we can get a few states lined up, others will follow. If a person carries an unlabeled can into Pennsylvania, for instance, he is liable to the penalties called for in that state.

DR. JACKSON said: All of these patients are children. The cost of hospital care is $1.50 per day for each patient. This is an economic question. I move that the Chairman of this Society appoint a committee of five to confer with the committee of the American Medical Association to form recommendations for the action to be taken by this Society, and to present same at the next annual meeting.

This motion was duly seconded and carried.

The following members were appointed to form this committee: Drs. Imperatori, Lynch, McKinney, Dean and Carmody.

WEDNESDAY AFTERNOON SESSION.

Report of Eight Endoscopic Cases, Dr. C. J. Imperatori.

DISCUSSION.

DR. WOLFF FREUDENTHAL said: In regard to the web of the trachea, mentioned by Dr. Imperatori, I should like to mention an interesting case which came under my care several years ago. The patient, a young man of about 25 years of age, had been tracheotomized in his early childhood on account of diphtheria. Soon afterwards a difficulty in respiration set in that lasted during all these years until it reached that degree of marked dyspnea, with which he presented himself. As the cause of it a web was seen below the glottis, which left only the posterior commissure open. In fact, at first sight it looked as if there was another glottis below. We tried to remove the web by means of the direct method, but the patient became cyanotic and collapsed. Tracheotomy was done hurriedly and everything removed from the trachea that could be seen. He recovered quickly, but returned about a year later in the same condition as before. Again removal by the direct method was tried, and again the same happened. Tracheotomy and removal of the web and of the granulation tissue was done once more. After that he felt so well, that during the war in spite of his claiming occasional dyspnea he was almost enlisted in the army, had it not been for one of my assistants who recognized him. Four weeks later he suffered from severe dyspnea, so that he had to be tracheotomized at once. An extensive operation was done this time, but during the following night he succumbed to a sudden severe hemorrhage.

DR. LYNCH said: Relative to treatment of the esophagus with a heated bougie, I have been using this method for the last two years for strictures of the esophagus run up to 45° C. I don't know whether that is equivalent to 120° F. I leave the heated bougie in place half an hour; using this about three times a week, it brings severe cases into the category of mild cases. You can increase the rapidity of dilatation by this means.

In regard to tracheal web, I had a case following a scar by the actual cautery.

DR. T. E. CARMODY said: I would like to congratulate Dr. Imperatori on these cases. I will mention the Dean electric bougie. My experience has been the same as that of Dr. Lynch. I have had one case of congenital stricture of the esophagus at the diaphragm. The patient was 31 years of age, had always had trouble in swallowing, and had never eaten anything solid. He was treated for 4 months, at lengthening intervals, and now has complete relief which has lasted nine months.

The egg shell in the larynx reminds me of a case I saw with part of a celluloid duck in the larynx, embedded in the anterior and posterior commissures. The X-ray was negative, but a portion of the toy was found in the larynx between the cords and it was easily removed. Then the mother remembered that the child had been playing with this toy.

The upholsterer's tack reminds me of one I saw a few months ago. The child was sent from a town 150 miles from Denver. On the way in it was given a plate of beans. It seemed best to give ether. The child vomited and then aspirated pieces of bean. I removed two pieces of bean lodged above the tack and then the tack.

DR. J. W. JERVEY said: What is the rationale of the method of heating the bougie in these cases. I don't know of any other canal in the body that has been treated successfully by the application of a heated bougie for the relief of stricture. I would like to know the reason of this procedure.

DR. L. W. DEAN said: Three years ago I thought of the use of heat for the dilatation of esophageal fibrous stricture. In Germany, the Genito-Urinary men were using electrically heated bougies for fibrous urethral strictures. By the use of the heated esophageal bougie a white dry fibrous esophageal stricture is converted into a soft moist stricture. This can be much more easily dilated mechanically than before the heat is applied. With too much heat you may get too much edema and the esophagus may become closed. You can always pass a larger bougie after the use of heat than before.

Traumatic Rupture of Oesophagus During Dilatation. Recovery. X-ray of Coin in Oesophagus. Color Drawing of Cyst of Epiglottis. Removal Under Suspension Larngoscopy, Dr. Henry H. Forbes, New York.

DR. FORBES said: This slide shows the earily part of the treatment when complete stricture is present. Perhaps too much force was used in getting the tube in as in the other slide there is a curious appearance of the barium, indicating a rupture of the esophagus into the mediastinum. It is not clear whether the abscess emptied into the bronchus. The patient finally recovered.

(Coin) The laity are getting plenty of information about bronchoscopy. In this case while the physician insisted that the child had not swallowed a coin the mother insisted on bringing the child for an X-ray. The coin was found and removed.

The third case is one of cyst of the epiglottis removed under suspension laryngoscopy. We use suspension whenever we can for teaching purposes. Last year Dr. Taylor reported a case of cyst. They seem rather rare.

DISCUSSION.

DR. W. B. CHAMBERLIN said: Some years ago I removed a cyst under suspension laryngoscopy. I discovered it by accident. I thought it was an enchondroma on account of its hardness. When using the knife in order to reach it the cyst ruptured. I believe Dr. Freudenthal reported a similar case.

DR. WOLFF FREUDENTHAL said: I reported 4 cases of cyst of the glottis removed by suspension. One reason for using this method is that it is the safest. It is very difficult, however, when there is bleeding and you must use cautery to control the hemorrhage until it is stopped.

Dr. J. Crosby Greene said: The cases of rupture of the esophagus are of sufficient rarity to stress a few points underlying all of the cases. The cases do not all die when they have rupture of the esophagus. I have seen two cases where laceration was followed by cure. The prognosis is not, as a rule, very good, however. If mediastinitis has set in the outcome is almost invariably fatal.

Dr. R. C. Lynch said: In regard to cyst of the epiglottis—I have seen a case of angioma of the base of the tongue and lingual surface of the epiglottis. We had difficulty in getting rid of the tumor, which was the size of an English walnut. It pressed over the peak of the larynx and produced dyspnea. One saw the tumor well by indirect method. After giving the anesthetic the patient had difficulty in breathing because the muscles became relaxed and the epiglottis pressed down over the tip of the larynx and increased the dyspnea. We used suspension and put a suture in the tip of the epiglottis. By tying that to the suspension apparatus we continued the anesthetic to the point of surgical anesthesia, but could not remove the tumor because the spatula of the suspenion apparatus hid the lingual portion of the tumor and the suture hid the other part of the tumor. We then performed a sub-hyoid pharyngectomy and removed the tumor. This gave a very good view of the inside of the larynx, and allowed us to work out through the external wound. The tumor was turned down to expose the lingual face of the epiglottis, going well down into tumor tissue so there was no bleeding at all. Then by making strong traction of the epiglottis and switching the spatula to the opposite side we continued the dissection of the tumor to the base of the tongue, through the sub-hyoid pharyngectomy wound, and then brought the thread back into the mouth. Then we sewed up the sub-hyoid pharyngectomy wound. Until that time he was in good shape but he now began to choke so we reintroduced the suspension apparatus and held on to the stitch attached to the tip of the epiglottis. Then I put in 2 mattrass sutures to the base of the tongue, from the pharynx, after this had healed the whole epiglottis was adherent to the base of the tongue. The epilttogis is normal and the voice is good.

Dr. Taylor said: I saw this patient before coming and he never had reappearance of the symptoms. The epiglottis is very resilient. After the long pressure of the cyst and on forced inspiration the epiglottis tilts back and forth, acting more or less as a valve.

Dr. L. W. Dean said: In regard to laceration of the esophagus, I was much interested in what Dr. Greene had to say. I have come to the conclusion that in any case of stricture of the esophagus in children or adults there is no examination made without danger. The bacteriological content in stricture cases is not the same as in normal cases. The mucous membrane is soft and there is infection. In one case of a girl who swallowed a bone, it was found in the stomach and there was no examination of the esophagus. Three days later there was a temperature of 105° and the surgeon thought of peritonitis. The patient died and at autopsy an injury to the mucous membrane of the esophagus was found with abscess and mediastinitis following the scratch. Death was due to mediastinitis. I believe no examination is without danger.

Dr. H. P. Mosher said: Dr. Greene said that examination of the esophagus in children is more dangerous than in adults. I think every esophageal examination is on the edge of a tragedy. In one case we gave a child an esophageal dilatation four or five times. Even without ether the child got pneumonia and finally died of pneumonia.

Dr. H. H. Forbes (closing) said: I feel as Dr. Mosher does about esophageal cases, and also about the use of general anesthesia; but in children I believe it is necessary to use general anesthesia, because one has to have a tussle sometimes even to put in the tongue spatula. In the case shown there was extensive trauma to the esophagus below the line of the stricture, and certainly there was pulmonary complication. The X-ray shows inflammation and then clearing up. In regard to the other case, in the last few months the parents have called our attention

to these accidents, rather than the physician. In one case at Springfield, Mass., a child was playing with peanuts, and afterwards coughed often. The mother brought the child to the clinic where half a peanut was removed. In the case of cyst of the epiglottis, we had the services of an artist who was able to make a good drawing of this case under the suspension laryngoscopy.

A Case of Urticaria of the Trachea, Dr. Freudenthal.

DISCUSSION.

DR. F. O. LEWIS said: I have seen urticaria of the larynx following administration of hay fever vaccine. It was not sufficient to warrant surgical treatment, and rapidly disappeared.

DR. FREUDENTHAL (closing) said: It is interesting to see that these cases occur more frequently than we thought. In a case about a year ago with severe hemoptysis, I could not find anything in the larynx or air passages to account for it. The lungs were negative. The left vocal cord was firmly fixed in the median line, which suggested pulmonary tuberculosis. There was, however, no pulmonary lesion, so examination for specific disease was made and the Wassermann was found to be four plus. Several injections of salvarsan were given, after which for 9 months there was no dyspnea. This was probably gummatous affection of the trachea.

The Peanut Problem, Dr. J. W. Jervey.

DISCUSSION.

DR. ELLEN J. PATTERSON said: These are very serious cases in small children. In the case referred to where the child coughed up a piece of peanut, I had already removed half of a peanut kernel. It is a great problem, taking care of the thick tenacious secretions after the foreign body has been removed. The peanut is often coughed up, but the secretions give symptoms afterwards. The cases don't recover without bronchoscopy to evacuate the pus; but some cases do without tracheotomy. I would try bronchoscopy first, without preliminary tracheotomy. However, I think it is a good suggestion.

DR. T. E. CARMODY said: These cases give more trouble from poisoning of the membrane than any other factor. There is another nut which does not cause any trouble of this kind. This is the pinyon nut. Where the pinyon nut has been masticated and the pieces are small you have to use suction to get rid of the fragments, using a tube with an open end and drawing the pieces into the suction bottle. It can be done without tracheotomy, but the latter is sometimes the easier procedure.

DR. MOOREHEAD said: Although most of the peanut cases are intensely toxic and have much secretion, I saw one in a child 18 months old where the peanut had been in the right bronchus 3 months and yet there was no particular irritation. This was a surprise to me as I had always expected to see a good deal of trouble with a peanut.

DR. J. W. JERVEY (closing) said: My object in such preliminary tracheotomy was not to do away with bronchoscopy, except insofar as tracheotomy results in expulsion of the foreign body. Then we are better off. No tube is inserted, but the opening is of generous proportions, held open with sutures so that the poisonous secretions are expelled or coughed up. Usually there is a tremendous reaction in peanut cases. With a wide tracheotomy opening expulsion can take place by natural means or by suction cannula.

To be Continued